EXTERMINATORS LOG

APRIL 1937 "Don't Tolerate - Exterminate" VOL. 5, NO. 4

SAFE . . . SIMPLE . . . EFFICIENT . . . FLEXIBLE . . . PROFITABLE

DU PONT ANNOUNCES A NEW CYANIDE GENERATOR

The New Cyanide Generator

Available in 3 sizes—No. 10 for fumigating up to 10,000 cu. ft., No. 25 for fumigating up to 25,000 cu. ft., No. 100 for fumigating up to 100,000 cu. ft.

For safer, more profitable fumigation

Generate hot, low-cost HCN fumigating gas right on the job from CYANEGG* (du Pont Sodium Cyanide 96% minimum) by means of this new compact, simple generator. Operated and controlled from outside the structure or area to be fumigated. No pots . . . no piping of mills . . . one piece of equipment . . . one clean-up after generation, then equipment is ready for immediate use on the next job. Easily carried and handled for local or complete fumigation.

For safer, more profitable fumigation, use this new cyanide generator and CYANEGG. Write today for complete information.

DU PONT
REG. U. S. PAT. OFF.

*Reg. U. S. Pat. Off.

E. I. DU PONT DE NEMOURS & COMPANY, INC., The R. & H. Chemicals Department
Wilmington, Delaware

MOUTHPIECE OF THE EXTERMINATING AND FUMIGATING INDUSTRY OF AMERICA

ADVERTISERS

Advertising is the effective means to acquaint the buyer with facts regarding your products . . .

The Log is the best medium for making known your products to the Pest Control Industry

EXTERMINATORS LOG

A Magazine Devoted to a Cause to Which Mankind Is Indebted

Al Cossetta, Manager and Editor | J. W. Smith, Associate Editor

Cooperating with the National Association of Exterminators and Fumigators, Inc.

VOL. 5 APRIL, 1937 NO. 4

NATIONAL ASSOCIATION OF EXTERMINATORS AND FUMIGATORS

OFFICERS

President.....Bartlett W. Eldredge
116 Calvary Street, Waltham, Mass.
Regional Vice-President.....Milton G. Jorgenson
1310 Glendale Blvd., Los Angeles, Calif.
Regional Vice-President.....Harry J. Hammond
1016 N. Jackson St., Milwaukee, Wis.
Regional Vice-President.....Otto Orkin
Post Office Box No. 647, Atlanta, Ga.
Regional Vice-President.....William A. Elliott
761 Fulton Street, Brooklyn, N. Y.
Regional Vice-President.....Martin Meyer
213 S. Tenth St., Philadelphia, Pa.
Secretary.....William O. Buettner
3019 Ft. Hamilton Parkway, Brooklyn, N. Y.
Treasurer.....H. K. Steckel
108 West Rich St., Columbus, Ohio

DIRECTORS

C. Norman Dold, Chicago, Ill.
Edward H. Arnott, Indianapolis, Ind.
Wallace B. Tanner, Los Angeles, Calif.
Gilbert M. Stover, Baltimore, Md.
A. E. Ritt, Philadelphia, Pa.
William Phippard, Cincinnati, Ohio
Clark R. Bergseth, Tulsa, Okla.
Thomas C. Raley, St. Louis, Mo.
F. E. Bohman, Hartford, Conn.
Irving H. Josephson, Bronx, N. Y.
J. Mandlebaum, New Orleans, La.
Wilbur F. Smith, Pasadena, Calif.
C. Russell Lee, Detroit, Mich.
John P. Linn, Omaha, Nebr.
Irving Sameth, New York, N. Y.
P. Calvert Cissel, Washington, D. C.
Al Cossetta, Kansas City, Mo.
Max J. Levy, St. Paul, Minn.
George A. Rader, Berkeley, Calif.
Robert W. Laing, Cleveland, Ohio
Walter S. McCloud, Chicago, Ill.

MEMBERSHIP

ACTIVE: Open to any person, firm, association or corporation engaged in the service business of eliminating and/or controlling vermin, rodents, insects, germs, other pests and odors by the process of extermination, fumigation and/or disinfection. Dues $10.00 yearly.

Associate: Open to subsidiary firms of an active member firm engaged in the service work as above described. Dues $7.50 yearly.

Allied: Open to any person, firm or corporation, manufacturing or supplying products and /or materials for use in the exterminating and/or fumigating service trade. Dues $10.00 yearly.

For further details, communicate with

WILLIAM O. BUETTNER, Secretary
3019 Fort Hamilton Parkway Brooklyn, New York

CONTENTS

Editorial 4-5

Control of Subterranean Termites in Buildings 7
By Neely Turner

Ants 10
By John Hurd, Jr.

Chemical Attack Routs Clothes Moths 14
By J. A. Berninghaus

Commercial Entomology As a Profession 16
By J. J. Davis

Local Organization News 17

Picked Up From Here and There 19

Additional Patents Relating to Pest Control 21
By Dr. R. C. Roark

Published monthly by The Exterminators Log, 512 East 14th Street, Kansas City, Missouri. Subscription rate in the United States and Possessions $3.00 per year; Foreign $3.50 per year; Single Copies 25 cents; Bundles of 25 copies $5.00. Publishers not responsible for unsolicited manuscripts. No manuscripts will be returned. All contributions intended for publication must be sent in before the first of each month. Three weeks' advance notice necessary for change of address. Both old and new address must be given.

Editorial

Men and the Industry

THE history of any worthy industry emphasizes the truth of the assertion that the activities and accomplishments of any worthwhile organization reflect the vision and initiative of its dominant men and leadership. Since the inception of our National Association, our leaders, whose influence has been patent throughout, have done a splendid piece of work. Their keen insight into various problems and matters has enabled our leaders to cause the thinking pest control operators to sense the extreme importance of ethical practices in their profession. Their advice has brought about the solution of many urgent practical problems of our industry. In their own field of endeavor the reputation of these men establishes the standing of our industry nationally.

The expert assistance of such an outstanding entomologist as Prof. J. J. Davis, and of his splendid staff of workers and others who recently led out at Purdue in helping our industry to know more about pest control, helps us to make big strides in the right direction.

To realize what our industry is now doing, and then to look back just a few years ago and consider the general attitude that existed then presents a striking contrast. We should appreciate greatly what these men are doing for our industry. The conference at Purdue has brought much comment from those who attended. Throughout the country, the story of our conference has been published in many papers. This was made possible through the leaders of our industry, and with the splendid cooperation and support of our friends, the entomologists. The influence that this will have upon the public is greater than most of us might imagine. Whether we realize it or not, we must admit that much has been accomplished through the concerted action on the part of our leaders to raise standards of service, confidence in members, and better understanding among competitors.

The progress of our industry has been gradual, but nevertheless steady, and statements issued from time to time show great accomplishments, with commendable economy. We believe that without a question no industry heretofore organized into an association has made the advancement, in such a short space of time, as our industry has, or has accomplished more than we have. This is not a boast, but merely something of which we are justly proud. And we can rest assured that our industry will continue to develop with the splendid support and cooperation from the leaders in the pest control field and with the continued cooperation of the membership. Our dreams are now realities as far as our industry's doing things and going places is concerned. Pest control operators who never make any effort to support or work for the betterment of their industry may think of what others are doing and are accomplishing, but as long as they do nothing for themselves they will never realize any ambition, neither will they see their vague hopes materialize. When we consider the type of men we have in the industry, we marvel to think how willing they are to launch out and face grave responsibility unselfishly, how ready to help our industry make progress and a name for itself like other worthwhile industries. There is much yet to be done, and if all pest control operators would work with confidence in their competitors, and have a better understanding between themselves, it would not be long before our industry would reach its objective. The old adage, "Do your work, and your worth will take care of itself," has more than a little truth in it. It means more than just thinking of yourself and working for self. It means establishing a philosophy of life which makes life enjoyable and useful, and working with your competitors to the extent that confidence is built up that will conduce to healthy relations within the industry. If every operator could be impressed with the seriousness of this kind of philosophy, the benefits derived could not be estimated in dollars. It is this type of philosophy that is inspiring most of our members to press forward to bring about such a revolution within the industry.

It is this unselfish spirit that is responsible for the upbuilding of the once declining industry of a few years ago, that was looked upon by the public as rat and bug exterminators and what not. But what a different picture we have today—an old industry revived into a new and better industry—an old name which has been scoffed at and sneeringly looked upon, now endeavoring to educate the public to recognize that pest control operators are performing a real service to mankind. So let us emphasize again that the dreams that our leaders once looked forward to have become realities, and that the operators who haven't joined the National Association have lost much and some day may wake up to find themselves wandering to and fro like stray sheep.

Let us appreciate the cooperation of the earnest and responsible men who have demonstrated over and over their sincere desire to help the industry to prosper.

An Interesting Specification and Termite Control

THESE are days of Termite Control activities. We think that the industry is anxious to review every possible method that is employed to obtain business, as well as other facts of interest. Not so long ago, certain specifications were a part of an invitation to present bids. Let us quote part of material:

"**General Intention:** It is the declared and acknowledged intention and meaning of these specifications to provide chemical treatment of the stipulated buildings in such a manner that complete insulation against the entry of subterranean termites from the ground will be secured."

"**Chemical:** The chemical to be used shall be a liquid composed of a normally solid toxicant dissolved in volatile solvents. This chemical must be non-poisonous to human beings but of strong toxicity to termites. The chemical must be highly penetrating in ground and wood, long lasting in toxicity but with no more than temporary odor. To insure this long lasting quality in the toxicant, it must be practically non-soluble in water. The brand name and manufacturer of the chemical must be stated. The contractor must have had previous experience in the use of the chemical, and shall furnish a written recommendation from the manufacturer, including a statement that the chemical has been used successfully to protect other buildings for a number of years equal to the duration of the bonded guarantee hereinafter mentioned."

It might be well for the termite control industry at large to study carefully all the implications that are involved when such as the above become a part of specifications. Termite Control operators, fortunately, are taking the sane position that genuine knowledge is required in termite control. Superlatives, exaggerations, and over-emphasized catch phrases tend to confuse the public and with them come the attempt of pseudo-termite control operators to imitate such phrases. Fundamentally, there is the proper knowledge of termites themselves, honest inspections fol-

lowed by logical recommendations in the case of infestations. These recommendations will take full cognizance of structural changes that are imperative as well as intelligent services with proper chemicals, both as they have to do with lumber and soil treatment, depending upon the limitations that always are a part of the picture when termite control companies are engaged to do the work. This is all another way of saying that we have many bonafide termite control operators who perform intelligent services and use chemicals that are producing results. There is no such animal as "the most effective known substance for combating termites" —there are several good substances. By far the greatest factor is that of workmanship backed by the fulfillment of promises that are made in connection with the work assumed.

To return to the specifications. Sometime it might be well to have the Bureau of Entomology of the United States Department of Agriculture submit a thesis on "Complete Insulation" and what chemicals fit that category. One who became rather interested in trying to come to a conclusion on "insulation" said this:

> "From an engineering standpoint we know that we can insulate a house against electricity or heat, but surely NOT against Termites. TO INSULATE means to place in a detached situation or in a state of isolation as in Physics to separate from conducting bodies by means of non-conductors so as to prevent the transfer of electricity or heat. Also, in chemistry we speak of the isolation of an element. In each such case, where an insulation is designed, it is designed to be absolute, in other words, it is designed against any breakdown by counteracting forces. CONTROL to the contrary means 'to regulate or exercise a restraining influence' synonymous with governing, checking, curbing, etc. In TERMITE CONTROL WORK we all expect that we will have some breakdowns in some jobs and there is no use in beating around the bush. There is no chemical in existence today which applied to standing structures will give the guarantee that no breakdown will occur on some jobs. The Termite is too wily an insect. And it is for this reason that we incorporate our 5-year maintenance and free reservicing guarantee—for which the customer pays five years in advance—and I am sure that every honest and ethical operator not only knows of these facts, but also will admit them to his prospect. From the above it will appear to anybody that the use of the words 'COMPLETE INSULATION' as used in these specifications is absolutely misleading and cannot be enforced, and it cannot be lived up to even by the perpetrator of these pseudo specifications. If it were a possibility, there would be no necessity to provide for reinspections and free retreatments."

That sounds logical enough.

When it comes to the specification for the chemical, we wonder if the specifications purposely or inadvertently came by way of an attempt to steer things in any particular direction? No harm in asking the question. Possibly the industry might rather shoot holes in the specification as to chemical. At least, the Log would appreciate having a reaction to any such specification in the light of what is known about various chemicals used. The mere fact that these specifications were eventually withdrawn does not take from the fact that they had actually been offered to the industry for the purpose of bidding. The pest control industry should insist that no one, large or small, is in position today to insist that any given chemical has a corner on the market when it comes to timber and soil treatment. It is interesting to note in connection with the specifications in question that mention is made with regard to possible replacements of timber or other repairs that seem imperative in connection with the chemical treatment and subsequent damage. We like this specific reference.

Termite control operators fully realize the importance of structural changes that are necessary. There is, however, a practical angle which confronts many termite control operators which makes it difficult to have owners of property make all the structural changes by way of repairs and replacements that are desirable so that it is almost forced upon the industry to rely on chemicals both as to timber and soil treatment. The fundamental issue that confronts the industry is to know in more certain terms what chemicals are standing up regardless of the methods employed as to pressure injection, spraying or brushing of lumber and soil treatment barriers. We shall assume that three principal parts enter into a termite control job; namely, structural changes including repairs and replacements; timber treatment and soil treatment. The public, however, becomes confused somewhat over the interpretation of the "guarantee" that is offered and, therefore, it seems high time that the industry clearly define what is meant by "guarantee." It is one thing to guarantee that there will be no reinfestation but still another thing as to what will be done when there is a reinfestation. Some have argued that the "guarantee" means simply a question of a promise to make reinspections. Others argue that they intend to re-treat that portion of the building or area in which the reinfestation occurs. Possibly if the property owner were to insist that his interpretation of the guarantee also calls for the replacement of any timber that subsequently becomes infested after the initial treatment with its guarantee of no further reinfestation, it might have the effect of causing the termite control operator to be more explicit as to what is promised. At least the specifications made that point clear.

Sensible advertising is the greatest means whereby there can be built up proper respect on the part of the public. Where there is wholesome respect for the competitor who may not exactly use the same method or even the same chemicals, there is bound to grow up a better understanding leading to co-operative interest in having work done properly. There is room for all who will do work intelligently. Over two hundred firms in California alone are engaged in termite control work and this wholesome respect is rapidly becoming a reality. None of us is the "world's only" and for that matter it should not be a difficult task to combat such statements as "the **most** effective known substance for combating termites." The minute the word "most" is used it must imply the superlative beyond which there is no other. Bamberger's Department Store as well as other firms suggest a thought as they say "one of the largest." If emphasis is placed on TERMITE CONTROL, there should be no doubt as to promises that will be understood by the public to be served. Even specifications might be offered that will not attempt to confuse or apparently confine the bidding.

The Rent Dollar

A TENANT not so long ago remarked, "The owner should give me this building. I've lived in it 15 years and the rent I have paid totals more than the value of the building." All of us have probably heard similar remarks and possibly made the same remark ourselves. The tenant, however, failed to realize that the money he paid did not go into the property owner's pocket, but was largely paid out to buy services and comforts for tenants, to buy things other than bare shelter—to buy, for example, education for the tenant's children.

In the Chicago Real Estate Magazine C. L. Perkins wrote an interesting article in which he broke down the "rent dollar." We compliment Mr. Perkins on the article and feel certain that he has shown without doubt that the landlord is not the economic royalist of the financial aristocracy, living in luxury off the rent from his tenants. He has given a true picture of how the rent dollar is distributed. What is of interest to us as an industry is that portion of the dollar that might come to our industry. We submit an interesting table:

WHERE THE RENT DOLLAR GOES

	Cents
Fuel	18.1
Taxes	16.1
Repair and maintenance	16.00
Employes (janitors, etc.)	12.6
Decorating	9.4
Supplies	3.1
Gas, water, electricity	5.2
Legal and advertising	1.00
Refrigeration	1.8
Insurance	3.00
Exterminating and ash hauling	1.00
Management	3.00
Total	93.3
Interest on average mortgage on average unit ($1,500)	16.6
Total expense for every 100 cents collected	106.9

Again, we should repeat that criticism should not be found with Mr. Perkins as he places "exterminating" with "ash hauling." It rather affords us an opportunity to ask ourselves as an industry why we find ourselves placed in that category. It is everybody's guess. The conclusion is the important thing and we can only suggest

that it might be well to analyze ourselves. Can it be that our charges and type of work place us in that category? It does not appear to us that there is anything professional about the removal of ashes.

And one other thought about the classification: It might be interesting to know whether pest control or "exterminating" operations really take up much of the 1 cent allotted to the industry in the light of prices that we hear about so frequently that are charged by firms of the pest control industry. Our guess is that possibly 1-10 of the penny might be credited as coming to our industry. Do a little figuring yourself on the average apartment house at which you may be rendering regular monthly services.

There Is a Right Way to Do It

IT IS becoming more and more apparent that our industry cannot render service in a hit and miss way and get by with it. In spite of all the emphasis that has been put from time to time upon the fact that pest control operators cannot do justice to their work in this manner, many continue to follow the practices.

Those who attended the Purdue Course have heard that we must have the proper knowledge of chemicals, proper education as to what would be best and how best to service various premises in controlling pests, etc. If we do not consider these factors the industry as a whole suffers from the foolhardy attempts made on part of some who carry on their business in such a careless way. And be it known that sooner or later what is torn down will take much to build up again, especially in obtaining the confidence of the public. The lack of discretion in this matter in failing to consider the effect of such service, is causing the public to lose confidence in our industry. Let us use good common horse sense in this matter and while the National Association as a whole is endeavoring to raise the standards of our industry (and we are making splendid progress), be certain to render service in the right way, rather than in a careless way. Better would it be to pursue the "right way to do it," than "the wrong way."

Meeting of North Central States Entomologists

ONE of the most inspiring sessions that took place among the Entomologists, was the two-day session on March 4-5 at Hotel Baltimore, Kansas City, Mo.

These two interesting days were filled with valuable information and news of great interest. Entomologists from various parts of the country came to reveal some of the knowledge that they have obtained from their experiments. Your editor took the opportunity to attend a few of the meetings. Yours truly was pleased to meet some old acquaintances such as: Professor Davis, Dr. Roark, Dr. Flint, W. E. McCauly, Dr. Metcalf, Charles Denny and others who came from afar to attend the convention, and was reminded of the Purdue Course that the pest control operators had a short time ago.

In these meetings, many comments were made concerning our National Association and its work. If the pest control operators who have not attended any of these conventions as a whole, could have heard and seen for themselves what they were missing, they might wake up to realize that they have been passing up some of the greatest opportunities of self-improvement.

We have been assured by our good friend, Professor Davis, that many of these addresses would be sent in to be published in The Exterminators Log. We certainly appreciate the kindness on the part of our Entomologist friends who are so willing to cooperate with our industry. It is a growing conviction that the time has come for our industry to work with our Entomologist friends in order to make progress and accomplish more for the betterment of our profession.

Let us appreciate the spirit in which these men are willing to help.

Attention

Martin Meyer, as Chairman of the Transportation Committee of the Memphis Convention, is very eager to have special cars via rail from New York through Philadelphia, Baltimore and Washington from Chicago, and from the Pacific Coast, direct to Memphis for those of us who will attend the Convention. Attractive rates are available and will be made public at a later date after the spring schedules come out and definite routings and times can be announced.

HOPKINS

REDRATSQUIL

(TRADE-MARK)

POWDER AND LIQUID

Made from the genuine Red Squill Bulbs—the world's surest specific for rodent extermination. Oven-dried under a temperature of 176°. BIOLOGICALLY TESTED to assure maximum killing power.

Write for Samples and Prices

HOPKINS

Pyrethrum Powder

and

CONCENTRATED EXTRACTS

Consisting of 100% Pyrethrum Flowers

Milled to any degree of fineness. Hopkins "Crow-Brand" Pyrethrum Powder or Extracts assure you a high-killing-power finished insecticide.

Write for Samples and Prices

THEY SELL BECAUSE THEY KILL

J. L. HOPKINS & CO. IMPORTERS » MILLERS » MANUFACTURERS

220 BROADWAY, - N. Y. C.

When Writing Advertisers Mention the Log

Control of Subterranean Termites in Buildings

By NEELY TURNER, Assistant Entomologist
Connecticut Agricultural Experiment Station, New Haven, Conn.

FOR years those of us residing in temperate climates believed that termites were mostly tropical pests and occurred so rarely in the northern states that they were not worthy of serious attention. However, there were published reports of damage at early dates. These include Boston and Cambridge in 1876 and 1885, New York City in 1893 and 1909, Albany, N. Y., in 1900, Ohio in 1894 and 1896, and Baltimore in 1898. During the past ten years reports of damage in these and other northern areas have been increasing very rapidly. No very satisfactory reasons have been advanced to explain the enormous increase in reports of damage. In some areas it may be due to education of the public and to activities of termite control companies. In other regions it is possible that the large amount of speculative building during and after the World War produced a large number of highly susceptible dwellings in infested areas.

In his book "Our Enemy the Termite," Dr. T. E. Snyder acknowledges the increase in reports of damage, but makes no statement that termites are increasing in abundance. Doctor Snyder has also continually emphasized that there is no occasion for any exaggerated fears. He has stated ". . . serious termite injury to buildings is relatively infrequent and termite work may go on for years without involving the necessity for extensive repairs or reconstruction of foundation timbers and flooring." In our own experience in Connecticut we have found that less than 4 per cent of the buildings are seriously damaged and that most of these seriously damaged buildings are more than 50 years old. Many comparatively new buildings are heavily infested and these are potentialities for serious damage in the future. The danger of collapse of a building without warning is very remote. In nearly every case there is ample warning that the building is infested and is being damaged years before any serious structural weakness occurs.

Many termite control operators have exaggerated the amount of damage and the danger of collapse as a result of termite attacks. In some cases this type of sales effort has actually resulted in a loss of business because it was perfectly obvious to the owners of the buildings that no danger existed. If termite control operators expect to cooperate with state and federal workers, all exaggerations must be eliminated from advertising literature and sales talk. In the rare cases in which a building is found to be in serious condition, it seems logical to advise the owner to have it examined by a competent contractor or architect or by a building inspector. The judgment of these men will carry much more weight than the statements of any salesmen.

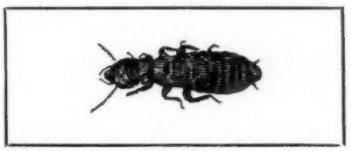
Biology of Subterranean Termites

According to Snyder, the more important species of subterranean termites in the United States are as follows:

Reticulitermes flavipes Kollar—the Eastern subterranean termite.

Reticulitermes hesperus Banks—the Pacific Coast subterranean termite.

Reticulitermes hageni Banks — light, Southern subterranean termite.



Reticulitermes virginicus Banks — the Southern subterranean termite.

Reticulitermes tibialis Banks—the arid land subterranean termite.

While there are many minor variations in the life history and habits of these species, the following account of the biology of Reticulitermes flavipes may be used as an illustration for all these forms. These termites are small and white, and about one-quarter of an inch long when fully developed. They live socially in colonies, usually located in moist soil near a supply of dead wood or other cellulose-containing material, which is used as food. The worker termites are white, blind, sexless and wingless and live entirely under cover. They make all excavations in the ground or in wood, construct covered runways over obstructions, and feed the young termite nymphs, soldiers, queens and males. The soldiers are about the same size and color of the workers, but have enlarged heads with strongly developed jaws or mandibles. Their sole function is to protect the colonies from enemies, such as ants or termites from rival colonies. In the closed runways they are very effective, but in the open offer little resistance to an enemy. The true queen has a black head and thorax and the abdomen is greatly enlarged and partly white. Supplementary queens are white in color and are more important in rapid colony development than the true queens. One or more males reside with each queen. True queens deposit eggs which may produce workers, soldiers or true queens and kings. Supplementary queens may produce workers and other supplementary queens, but cannot produce true queens.

At certain periods of the year and particularly in the spring, large numbers of dark brown winged males and females develop from certain nymphs. These forms swarm from cracks in infested wood or from short shelter tubes, fly short distances, usually not more than 75 feet, shed their wings, and seek a place in damp soil near a supply of food to start a new colony. If a suitable spot is found they mate and the female deposits 6 to 12 eggs. The young nymphs are fed by the king and queen until they become full-grown, which usually occurs in a year. Then the workers take over their duties and the queen starts her true function of laying eggs. Colony development is very slow; in five years only 5000 are present under normal conditions and this number can develop in one-half a cubic foot of wood. Colonies large enough to destroy lumber in buildings require years for development. The "swarm" of adults does not remove very many termites from the colony. The larger proportion is left and continues destruction. Swarms occurring in houses usually fail to start new colonies, and may be considered harmless except as indication that the building is infested. Even out-of-doors a majority of swarming adults die without starting new colonies.

The colony is not a compact unit with a definite royal cell. It may be spread over a large area with several reproductive centers connected by a network of runways. Colony location may be changed with variations in temperature and moisture, and all colonies except those in heated buildings migrate below the frost line and hibernate during the winter.

The rate of reproduction of our termites is worthy of comment. Contrary to popular opinion, queens do not deposit thousands of eggs a day. Although records are scarce, it may be assumed safely that a queen of our termites seldom deposits more than 60 eggs a day. The large number in colonies are due to the presence of many queens and the three- to five-year life of individual termites.

The Food of Termites

The principal food of termites is cellulose, which is obtained from living plants, dead wood, paper, cloth, leather and other products. They digest this with the aid of protozoa and bacteria which are always present in the digestive tract. Although they prefer damp, rotting cellulose, they may feed on sound dry wood by carrying in moisture and fungi in the burrows. For this purpose they require a constant supply of moisture, which is usually obtained from the soil. They cannot utilize water from pans or other open receptacles.

Termites are capable of persistent concerted action, with behavior that in some cases seems to approach intelligence. They are able to locate susceptible points in building construction by constant searches for new sources of food. Once in a building, they continue their destruction unless they are checked by natural or artificial means. Contrary to popular opinion, individual termites do not destroy wood rapidly. Destruction of wood is a slow process and serious damage to buildings is usually a matter of years rather than of weeks or months. Wood is destroyed rapidly in case susceptible buildings are erected in areas in which large termite colonies are present or if damaged wood is replaced by sound wood with no protection provided.

Control of Termites

It is very natural to attempt to apply the methods of control developed for other insect pests to control termites. However, the destructive forms of subterranean termites live entirely under cover. The individuals may be killed by such innocuous chemicals as common table salt and borax, but it is very difficult to reach the termites to apply any such material. Trapping, spraying, use of poisoned baits and control by parasites have not been applied successfully to termite control. Complete extermination of a colony is not practicable and in most cases is impossible, but many individuals can be killed by the use of soil poisons. Fumigation or application of heat will kill termites but will not prevent re-infestation. Treatments brushed or sprayed on infested timbers or poisoned dusts injected in burrows have not proved effective against subterranean termites.

For a period of at least 35 years the most practical, successful and permanent method of control has been to exclude termites from buildings by proper construction meth-

ods. To do this intelligently we must know how termites enter buildings and what materials and methods will stop them. If termites in an infested building are cut off from moisture they die at once. No special efforts to kill them are necessary.

Subterranean termites enter buildings at some contact, either direct or indirect, between the wood portions of the building and the ground. Indirect contact may include cracks or hollows in foundations or floors and entrance by means of shelter-tubes constructed over foundations. A termite infestation might be brought into a building by storage of badly infested wood, such as fire-place wood. If the termites in such material were able to reach moist soil within a few hours they could become established in such a manner.

Termites do not enter buildings through open windows or doors, or crawl in through cracks in clapboards, etc. Although they could be introduced in a building in structural timbers, it is hardly conceivable that a competent carpenter would use a badly infested timber in building construction.

Termites can penetrate the following materials:

1. Lime mortar, which they dissolve by means of an acid secretion.
2. Masonry work of brick, stone or other units, as commonly laid up, cannot be considered proof against penetration by termites because of vertical and horizontal hollows.
3. Tar and asphalt compounds are penetrate by termites. They may also penetrate hard and soft paint films, poisoned paint and two-ply roofing felt.
4. Termites can penetrate cracks in solid concrete, such as cracks between floors and walls, and settling cracks in foundations.

Termites cannot penetrate:

1. Solid concrete without cracks, or solid unit masonry laid solid in cement mortar, but they can construct shelter tubes over such masonry.
2. Wood treated by a standard pressure process using effective preservatives. However, they can construct shelter-tubes over treated timbers to reach untreated wood above.
3. Copper, zinc or iron sheet-metal, and they cannot construct shelter-tubes up over the edges of properly installed metal termite shields.

On the basis of these known facts, it is possible and feasible to erect buildings which cannot be penetrated by termites. It is also possible and practical to reconstruct existing infested buildings to meet termite resistant specifications. Detailed directions for this reconstruction can be found in the pamphlets and books listed in the bibliography.

Soil Treatments

For a period of at least 40 years, various investigators have made attempts to find a satisfactory soil treating material to kill the termites present or to act as a barrier against their access to a structure. However, the California Termite Investigations Committee was unable to find that any such treatment was a standard practice or that any conclusive experiments or observations supported any such treatment. Doctor Snyder states: "The use of soil poisons is, however, still very much in the experimental stage and on present information cannot be recommended as a permanent remedy."

Experience has shown that results obtained in one section of the country are not always applicable in other regions. For instance, in New England low soil temperatures, alternate freezing and thawing of the soil in winter, the presence of large amounts of soil moisture which frequently move laterally, and the presence of rock ledges which prevent treatment of subsoils in many localities all act against successful use of soil treatments which have proved valuable in subtropical regions. Tests of soil treatments in temperate climates are in progress but to date no official publications describing them have been issued. Many of these treatments may seem effective at the present time, but in the light of past experience it is unwise to draw conclusions until the tests have been completed.

At the present time soil treatments may be regarded as (1) an aid in connection with structural changes or (2) as a temporary palliative. There are many infested buildings which have only a few termites present and have not been badly damaged. In such buildings the use of minor structural changes in connection with a thorough soil treatment seems to be logical. The changes needed may be classified as follows:

(1) Removal of wood in actual contact with the ground.

(2) Provision for adequate clearance in unexcavated areas.

(3) Replacement of wood bearing posts with lally columns.

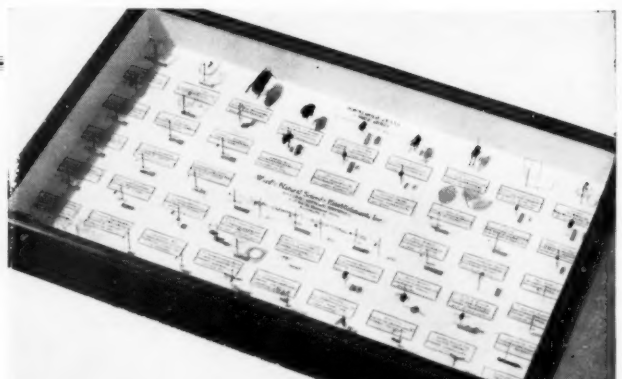
(4) Reconstruction of wooden basement partitions.

(Continued on Page 9)

Household and Industrial Insect Pests

—*Collections for Display and Reference*

Fifty of the most important household and industrial insect pests that can be controlled by the exterminator are included in Ward's Master Reference Collection. Labels give common and scientific names and habitat of insects. The whole is mounted in a handsome glass-topped wooden exhibition case. Your letterhead or a large printed label can be included. Smaller collections of species of your own selection are available.



Ward's Master Reference Collection

Pest Infestations for Research

Infestations of living insects of most species of insect pests are ordinarily available from Ward's. Prices are low. Research workers have found Ward's Breeding Cages and Ant Nests efficient for rearing live insects.

Pocket Mounts and Life Histories

Salesmen should be furnished with the insects which their products are designed to combat. Pocket collections and life histories make an admirable demonstration and stimulus to customer interest.

SEND FOR FREE DESCRIPTIVE LEAFLET NO. 375

WARD'S NATURAL SCIENCE ESTABLISHMENT, Inc., 298 N. Goodman, Rochester, N.Y.

(5) Replacement of wooden basement window frames with metal frames.

(6) Metal shielding to protect the framework adjoining masonry porches.

Many operators feel that the use of such structural changes is an admission that the soil treatment is of little value. This is not the case at all, although in some cases the changes might be effective without soil treatment and the soil treatments might be effective without structural changes. The use of both types of control increases the chances of permanent success.

Soil treatments may serve as palliatives particularly in temporary structures or buildings of too small a value to warrant expensive alterations. During the past few years many home owners have used such a treatment with full knowledge that it is not a permanent protection against termites. There is a place for this type of treatment, but the operator should make it plain to the owner that permanent control is not to be expected.

Certain types of structures are so susceptible to termite entry that soil treatments cannot be used with confidence. These include (1) old colonial houses with very porous stone foundations, (2) inexpensive wooden houses built directly on the ground, (3) large brick buildings with a dead-air space in the masonry wall, (4) buildings with foundations of hollow concrete blocks (unless laid on solid concrete bases which extend above grade level) and (5) summer cottages built on wood posts or piles set directly in the ground. If such buildings are heavily infested by termites it is very difficult to stop damage with soil treatment only.

To summarize, there is at present insufficient evidence to prove that soil treatments are permanently effective in controlling termites. However, there is a definite need for soil treatments (1) as a palliative in buildings not valuable enough to warrant extensive structural changes, (2) as an aid in connection with minor structural changes, and (3) in masonry buildings with concrete floors, in which termites are damaging stored materials.

Treatments of Timbers in Place in a Building

During the past few years termite control operators have developed various systems for treating timbers in place in infested buildings. There is little evidence published to date in regard to these methods. They are usually accompanied by a thorough soil treatment and sometimes by structural changes. Although thousands of buildings have been so treated, there is no published analysis of the effectiveness of the treatments. Certain disadvantages are apparent: (1) Many kinds of wood are very difficult to penetrate; (2) damp wood cannot be penetrated satisfactorily; (3) many of the treating fluids contain volatile solvents that are inflammable, and their use constitutes a fire hazard; (4) it is very difficult to reach all parts of all timbers needing treatment; (5) in actual practice the treating fluid follows termite burrows or comes out through seasoning cracks rather than penetrating the wood.

Discussion

In spite of the enormous amount of work done in the past on termite biology and control, much remains to be done. As contributions are made it is possible that the application of control measures may be changed. However, no new method of control can be accepted until it has stood the test of successful application under a variety of conditions.

Literature

Kofoid, C. A. (Editor. Termites and Termite Control. 2nd ed. pp. 1-734. University of California Press. 1934.

Contains a large amount of information about all types of termites found in this country, results of tests with various soil and wood treatments and recommendations for control of all types.

Snyder, Thos E. Our Enemy the Termite. pp. 1-176. Comstock Publishing Co., Ithaca, N. Y. 1935.

Contains an excellent account of biology and control of subterranean termites and much information on other types. The result of 26 years of work with termites.

The following publications are believed to be available without charge from the publishing offices:

Snyder, Thos. E. Injury to Buildings by Termites. U. S. D. A. Leaflet 101, 18 pp. 1933.

A brief summary of control of subterranean termites.

Preventing Damage by Termite or White Ants. U. S. D. A. Farmers Bulletin 1472. 21 pp. 1934.

A more complete summary of the control of termites in buildings and in living plants.

Miller, A. E., and Flint, W. P. Habits and Control of Termites. Illinois Natural History Survey Circular II, revised. 12 pp. 1931.

A summary written in the form of questions and answers.

Bentley, G. M., and Rogers, J. L. Work of Termites or "White Ants" in Tennessee. Division of Plant Disease Control (Knoxville), Bulletin 49. 24 pp. 1931.

An account of termite damage in Tennessee with control measures.

Turner, N., and Townsend, J. F. Termite Control in Buildings in Connecticut. Connecticut Agricultural Experiment Station, Bulletin 382. 36 pp. 1936.

A summary of the biology of R. flavipes and its control in relation to building construction.

"Better Mousetrap" Finally Gets Built

Rodents Will See Reflections, Beat Perpetual Pathway, Inventor Tells Congress of Colleagues

Chicago, March 15.—A perpetual motion mousetrap that does its own work with increasing efficiency was announced today by Albert G. Burns, as he prepared for opening of the National Inventors' Congress.

Mr. Burns, president of the congress, says the mousetrap "Is a lulu."

It's a business of mirrors. The mouse looks in, sees what it thinks is a lot of company, is trapped trying to be sociable. When the next curious mouse is attracted, it sees not only its own likeness in the mirrors, but those of its unfortunate predecessor.

By the time a houseful of mice is trapped, every newcomer thinks it's a wild convention.

Hibernating Mosquitoes

Bears are not the only beasts of prey that spend the winter in caves. Animals much smaller than bears, but much more likely to bite the average citizen, to-wit, mosquitoes, also hibernate in natural caverns, according to Prof. J. D. Ives of Carson and Newman College, Jefferson City, Tenn.

Professor Ives recently explored a number of Tennessee caves during the fall and winter months, and found a total of more than 3000 of the insects. Almost all of them were females, and the great majority belonged to the genus Anopholes, notorious as malaria carriers. Relatively few, however, belonged to the particular species that is the worst offender in this respect; most of them belonged to a species that prefers the blood of cattle to that of human beings, though even these are capable of transmitting malaria on occasions.

Practically without exception, Professor Ives and his workers collected their mosquitoes in the twilight zone of the caves, where full daylight does not penetrate, yet where it does not become pitch-dark. This is the kind of light many species of mosquitoes prefer; and the twilight zone also gives them the degree of air humidity they like best.

Altogether, then, caves offer good homes for mosquitoes.

Professor Ives suggested methods of spraying that might be worth trying, where caves harboring mosquitoes are too near human habitations.

To the Tune of "Home On the Range"

Words by Mr. and Mrs. Byron R. Hilliker of the Montgomery Exterminators

EDITOR'S NOTE: *This song was sung by a quartette at the California State Convention at San Jose, much to the pleasure of all attending.*

Oh, give me a home
Where the Silverfish roam
And the Rats and Mice really reign;
Where often at night,
Cockroaches invite
The Ants for a feast on the drain.

(Chorus)
Homes, Homes, on our range,
Where the Bugs and Rodents do play;
We can work night and day
And we know it will pay
If we do it the organized way.

Oh show me a house
With a Bedbug or Louse,
Where the Spider and Flea play with ease;
Where the Moths seem to be
In the closet I see
And the Gopher digs under the trees.

(Chorus)

Oh, give me a home
Built close to the loam
Where the Powder Post Beetle can be;
Where the Termites galore
Can eat on the floor
And the Fungi we're apt to see.

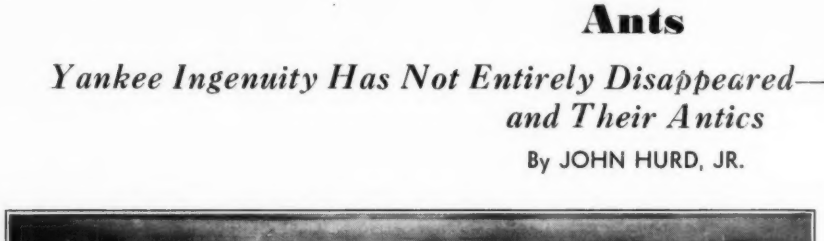
(Chorus)

"Ill words are bellows to a slackening fire."

Ants

Yankee Ingenuity Has Not Entirely Disappeared—A Tale of "Austin's Ants" and Their Antics

By JOHN HURD, JR.



EDITOR'S NOTE: *Through the courtesy of the Dartmouth Alumni Magazine, Hanover, N. H., permission has been granted to The Log to publish what we consider a unique human interest story. The Log offers the story to indicate a means which might well be adopted by firms throughout the country to present phases of insect and pest life and thus make the public more conscious of pests.*

LEANER and hungrier grow the looks of bears around these parts. Hanover boy-capitalists are interfering with their victuals. Deeper and deeper into the woods the bears retreat but human beings seeking success press on persistently and even there they interfere with the bears' food supply.

Why should this be? Because mankind is curious and, being curious, wants to learn. The fault—if you are on the side of the hungry bears—lies not only with Americans but also with the French, the English, and the Germans. Soviet Russia as yet plays no role.

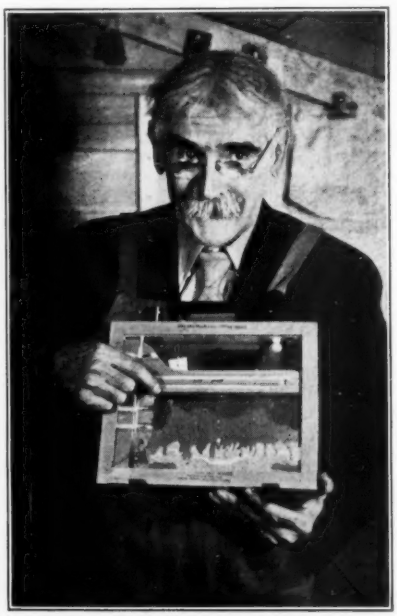
Or if you want to blame some one person, blame Professor F. E. Austin '95. He offers $4.00 a quart for ants to boys who will bring them in alive. He wants them by the thousands for business and educational purposes, and the bears, who look upon ants as we do on roast beef—a tasty and nourishing and almost necessary food—discover to their chagrin that their frigidaires of hollow trees and rotten logs have been rifled clean.

Even at $4.00 a quart, which is good money for Northern New England where the leaves of trees are somewhat more common than dollar bills, Mr. Austin cannot get enough ants for Americans and foreigners interested in the home life of the ant, in his business and love life, in his cooperative and warring enterprises, in his death and funeral rites.

Is it any wonder? Those with a head for figures have estimated that a minimum of 3,650,000 ants a year leave Hanover. Do not think that Mr. Austin will take any ant; he is selective. Of the 5,000 different kinds of ants he prefers the carpenter ants because they are the largest and most interesting to watch. And of the carpenter ants he wishes the different colonies kept separate, which requires some integrity in the boy-searchers.

Ants, as you may not know, are as cantankerous as those white pointed-nose bull terriers that fight and kill just because they do not like another dog's looks. Put a strange ant into an ant colony and the colony immediately rush into combat. The unlucky intruder must fight whether he wants to or not, but fighting will do no good; his enemies will kill him. Put a whole colony in one where it is not native and there will be war on a large scale and the war will continue to the bitter end and the bitter end is death.

You may have seen the look of consternation on a housewife's face when she has discovered ants in the pantry and you therefore wonder what the Hanoverians are doing importing them from the woods where they are sober and God-fearing critters busy and happy in their hollow trees. You will be the exception or a resident of upper Thibet if you have not heard about Professor Austin's ant houses. Each year some 5,000 persons wear down a path to his workshop on South Park Street across from the football field. In December he sent out 2,000 ant houses all over the country. It is a poor month when 400 do not leave town. Twelve men work for him building the ant houses in home workshops about the countryside, White River Junction, Wilder, West Lebanon, and Lebanon.



DISCOVERER OF ANTS
At least Prof. F. E. Austin, Dartmouth College, has shown that ants are very interesting and amusing insects to have around the house.

One ant house went over on the **Queen Mary** on her maiden voyage and created a mild sensation as it was shown proudly over the ship. The vice president of the National Broadcasting Company was sending it as a present to the president of the British Broadcasting Company. Two ant houses have gone on other voyages of the **Queen Mary** and the English seem to like having them and, it is said, like to call the ant houses palaces because queens do not live in houses.

If you do live in upper Thibet, you will want to know first what is an ant house and second how did Mr. Austin think of it in the first place. Even if there is nothing new under the sun, there is always a new vantage point. Ants existed during the time of the Greeks and flourished during the Middle Ages, but it took a modern man and a professor who taught Sunday School in his spare time to see the ant as Aristotle never could.

One day one of Mr. Austin's boys asked him about how ants lived and Mr. Austin advised him to take a spade, open up a hill, and see what he could see. The boy tried it and told Mr. Austin ruefully the next time they met that he could not see much because the dirt kept caving in.

An Engineering Challenge

This was a challenge which a Professor of Engineering could not refuse to accept (Mr. Austin used to be connected with the Thayer School as Professor in Engineering and Mechanics). Simplicity in construction in everything, and you will admit that if only you had thought of this idea you could have worked it out for yourself.

First Mr. Austin built a wooden frame about 18 inches square and placed two panes of glass for the front and back panels, which left a couple of inches of space between. Into the empty space he threw some coarse sand, a layer of sawdust, and some plain Hanover - New Hampshire - South - Park - Street dirt.

The next move was a reconnoitring expedition with a spade in search of an ant hill. Those were the days when ants had homes within a stone's throw of the College. Within a few minutes Mr. Austin was back with a lot of ants which he deposited in the frame. Sure enough, the ants could not stand about like lazy loafers and within a few minutes they set themselves to work in their new environment. They began to dig into the dirt, to carry the grains of dirt to the surface as the shaft sank below the surface and to work with a nonchalant vim and an unassuming steadiness even though Mr. Austin kept his gaze glued on their now naked activities.

Nor did the ants become discouraged. They worked more and more during the ensuing days until the glass ant house was honeycombed with tunnels.

That is all there is to it, so far as principle is concerned.

But Mr. Austin has allowed his ingenuity to show itself in various embellishments of this principle. He developed the ant house and then branched out into other kinds of structures. Now if you find a mere house boring because you live in one almost every day, you may buy an Ant Coal Mine or an Ant Fire Department or an Ant Polar Expedition or an Ant Palace.

Take the Antville Coal Mine, which is of unusual interest just because so few of us have even been down in a mine, fewer probably than have flown in an airplane. Before your gaze is a mining town with the miners at work excavating "sand" and "rocks" and "gravel" under the ground. A long vertical shaft serves as the tunnel through which the debris comes from the underground tunnels. At the top is the slag pile of excavated material. Day by day the dump pile grows larger and the tunnels longer and more intricate.

The coal mine has, as all coal mines should have, a whistle that first paralyzes the workers and then sends them scurrying into frenzied activity. You may blow the whistle whenever you please: the ants, who have a profound and consistent sense of duty, will rush to work.

Owners Proud of Their Ants

It will not be long before you begin to show off your ants as a dog owner does his dog. Just as the dog owner will always pose as one who knows a great deal about dog training even if his dog is completely undisciplined, so will you, now become a scientist, toot your mine whistle and cry commandingly, "To your picks, you sluggards. To your shovels, you rapscallions." And you will feel the power of a dictator, the most seductive of all forms of egotism, when the workers fall over one another, pell mell, in their anxiety to follow your commands instantly.

If you are a benevolent despot, you will not want to blow your whistle often. Even though you may want to work your ants ten hours a day, except Sundays, instead of the modern eight, the chances are that you will not want to sweat them overtime and on night shifts. You may then adjust a pin which will keep them from laboring more hours than you believe right under "The American Plan."

If you yourself are a miner living the life of a mole, you might prefer to own an ant city where all the activities are on a different plane. Then you will be looking into Mr. Austin's "Ant Boro" and then you will find a whole social grouping combining both ant and human terms. Why don't you pretend that for the moment you are an ant even if you have an uncle? Feeling like church Sunday? You will find in this ant colony some ants who go to their Anti-sin Church every day and to their Ant-Mission. Feeling like some amusement? Very well. Using the Long Dist-ant Telephone Company, you will telephone to the Ant-ic Theatre next door to D-ants Hall (not far from the Ant-iseptic Drug Company) for tickets. Upon arriving in the station you will buy a paper at the newsstant and take a taxi at the Amos and Ant-i Taxi Company. After the matinee you may want to do a little shopping at the five-and-ten Ant-Worth and have dinner at the restaur-ant where you will be sure to find some ant-mosphere.

But before dinner you may as well tend to a lot of errands to work up an appetite and so you go to see your Ant-torney-at-law, your physician Dr. Ant-idote, look up about a new car at the Ant-imobile Market, which has an Ant-iKnock engine, and see about a month's supply of food at the chain store, the Ant-lantic and P-ants-ific, and take out a new policy at the Insurants Office.

Ant Houses Help Insane

This ant-colony all under glass seems like the pinnacle of human ingenuity, but Mr. Austin has not stopped here. On the contrary. He is now working with the Du Ponts perfecting some new glass to be used in the ant houses that go to insane asylums. (Persons off balance mentally find themselves benefited by watching the order, the industry, the neatness, the balance, the spirit of helpful cooperation so manifest in an ant community.) At least one case is on record of one patient restored to normality.

This new glass will be bendable and unbreakable and be called Plastecelle.

And Mr. Austin has also a plan for a glass lens enabling old persons with poor eyesight to watch more easily the activities within. Any person who is afflicted with bodily ailments finds unending pleasure in watching the ants scurrying about on their job and being so quietly efficient. Large numbers of ant houses go to sanatoria and hospitals. Often a sick person who is too weak to read is still strong enough to turn his head and watch the 50 to 150 ants on the other side of glass wall occupy themselves happily and uncomplainingly about the business of everyday living.

Once a person has bought an ant house (it costs from $3.50 to $8.00 depending on the model and the store) the upkeep is very small. Even if you do nothing, the ants will live on for two months.

(Continued on Page 12)

When Johnny Comes Marching Home

"T' heck with Mom . . . ! I want that baseball mitt!"

" W O W ! ! ! "

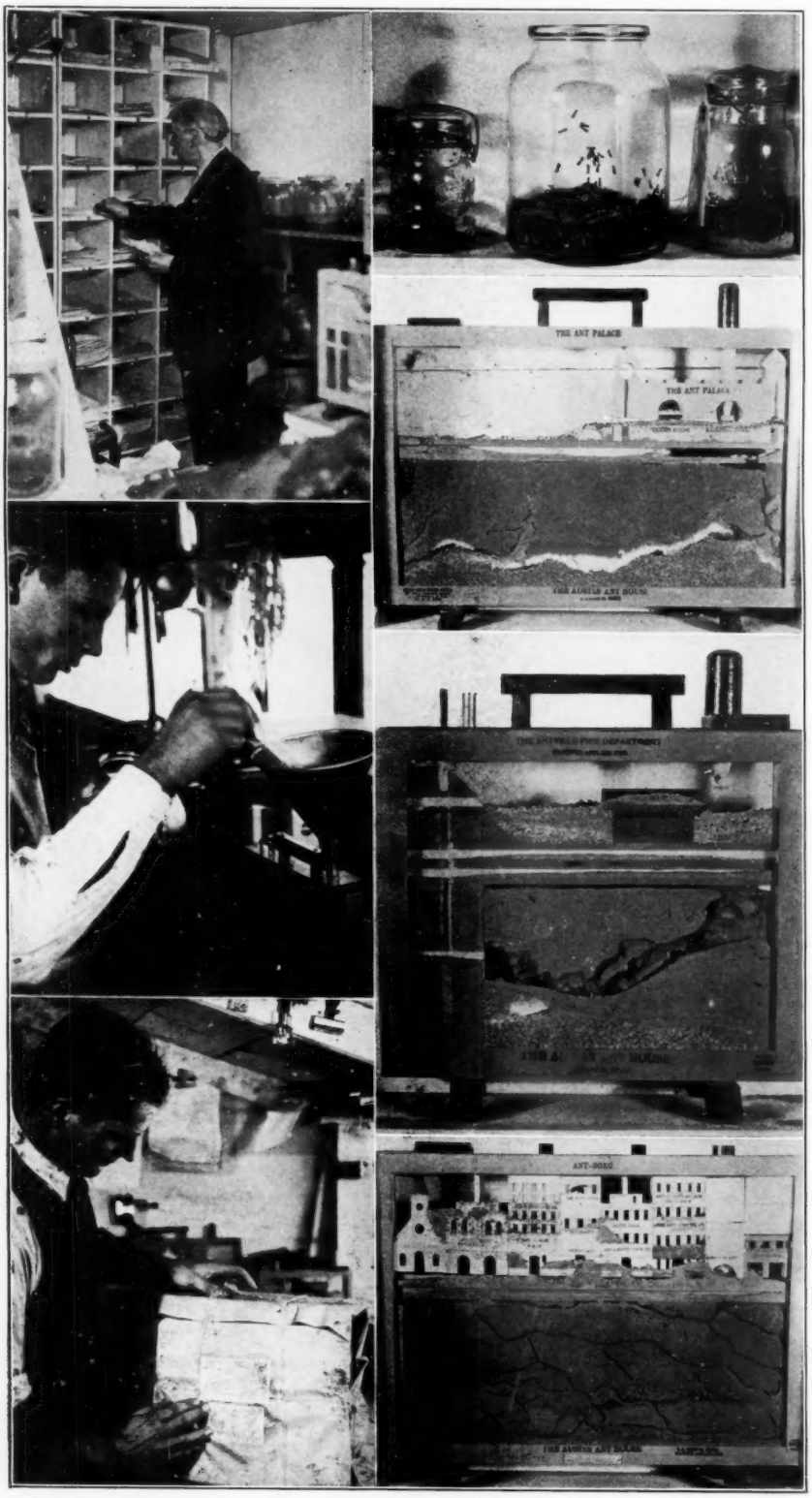
"Guess I'll borrow Willie's . . . !"

LITTLE JOHNNIES or Big Johns — they're all absent-minded at times. But that first sniff of LARVACIDE is a nudge they can't miss. That powerful tear gas warning sends them out in a hurry before damage can be done • Tears and maybe coughs for a few minutes — but that's better than taking chances • Think what this means to you as a professional man — in freedom from nervous worry • Consider, too, Larvacide excels in penetrating power — goes deep into upholstery, woodwork, floor and wall crevices — kills insects and larvae — and *sterilizes eggs so there'll be no hatching out after you're on your way* • You want Effective Fumigation plus Greater Safety. That means you want Larvacide • Illustrated 10 Page Bulletin — FREE — tells much you'd like to know about EFFECTIVE and SAFER Fumigation. Write for it.

LARVACIDE
CHLORPICRIN
REGISTERED

The Safer Fumigant

INNIS, SPEIDEN & CO.
Established 1816
117-119 LIBERTY STREET, NEW YORK
BOSTON • PHILADELPHIA • CHICAGO
CLEVELAND • KANSAS CITY
Factories:
Niagara Falls, N. Y. and Jersey City, N. J.



THE CYCLE IN THE HOUSE THAT ANTS BUILT

Professor Austin filing orders in his unique filing cabinet at upper left. Below: A helper tweezers ants through funnel into houses and another assistant carefully wraps and addresses the package. Upper right: Jars of ants of different sexes and varieties, and below the jars are, first an Ant Palace then a Fire Department, and the elaborate Ant-Boro, in which the creatures display the busy and varied existence of a thriving metropolis.

Once you learn to like your ants, you may find enough energy to feed them. No herculean strength is needed: a whole colony of 50 ants and one queen will flourish on —mark this well—one (1) drop of honey or of sugar per week. A person unwilling to extend himself to that degree might well be called the world's laziest. And one should not be generous hearted. If the ants get several drops of honey a week, they grow sluggish and die.

There is indeed just one other little duty. Ants do not like too dry a climate, and you should be big-hearted enough to humor your little pets and give them their three teaspoonfuls of rain water a week. If you live in Alaska or in Arizona, you may use snow water or distilled water.

That is all that there is to making ants comfortable, and anyone may see after a careful survey of the facts that ants are easier to care for than horses. If you grow fond of your busy workers that demand so little, you may reward them with an apple seed, but if you are indifferent the ants will never raise their voices in complaint but eat sawdust, which Mr. Austin has specially treated, and live on for another four or six weeks.

What about baby ants? There are baby ants, and nurses to go with them. If you want to prove the fidelity of the nurse-ants, tip your house enough to scatter the larvae and the pupae and watch the frenzy of the distracted nurses rushing about and protecting them from the earthquake or the intruder or whatever their hysterical imaginations conjure up as dangers. Don't be a meany and do it more than twice.

The larvae, you will tell your guests in a professional tone, are the baby ants and you will make the point that they are small, grub-like objects. They spin a sort of cocoon over themselves and transform themselves into pupae.

Queen's Debut Spectacular

When it comes time for the babies to be grown up, the nurses cut open the cocoon coverings and take out the full grown ants. The most spectacular sight is when the nursemaid ants assist the queen in her emergement. Watch for it.

Business men who are too busy, they think, to take any interest in ants may be willing to pause a moment to hear about this incident. **The New Yorker** ran for Russell-Lawder, of 445 East 65th Street, New York, a 15 line advertisement about Professor Austin's ant houses. The public became so interested that **The New Yorker** felt compelled to tell the world about it and did so by giving up an entire page to an advertisement in the March 8th **New York Times** telling the story about people's interest focussing on the fascinating life of the ants and the ingenious creator of the ant house with about a dozen pictures of ants and their palaces.

This story has been mostly about ants, but it could almost as well have been about crickets and bees and spiders and flies, for Mr. Austin raises them too. He—to be definite—builds cricket houses also and bee houses also made of glass. You can therefore see the mother cricket, anxious to lay her eggs, going out into the garden and depositing them in the soil using her ovipositor or sharp long probe which projects from the rear of her body to drill the hole. Often the eggs lie against the glass and a watcher can observe the process of hatching.

Crickets Have an Apartment

It's all very ingenious made still more ingenious by Mr. Austin, who is surely a humanizer. He doesn't have merely a cricket house, but rather he goes farther, builds

it in sections and calls it an apartment. As such it has a living room, with a baby grand piano and other tiny furniture, a furnace room, and a garden. Mr. Austin likes to tell you how he puts a drop of honey on the keys to stimulate the young boy cricket to practise his piano lesson. He delights in dropping a pea into the furnace which brings the father cricket to his sense of duty to go down and fix the fire.

You can learn a lot of things. You can learn that a mother cricket lays as many as 150 eggs in the cricket house. You can watch a boy and girl cricket marry and become a father and mother, have children, who in turn grow up, fall in love, marry and have children and make the original boy and girl granddaddy and grandmamma. All three generations will be living at home together and liking one another.

You can see the baby crickets changing their clothes of brownish-black into new suits of light yellow, a matter of some 15 minutes, for there is no particular rush to catch a train. Within two hours or so the new suit turns nearly black.

How does a cricket chirp? Try that question on your citified friends. Then tell them this: a cricket chirps not through his mouth but through his wings. The underneath wing has a series of tiny teeth like saw teeth. On the top of the lower wing is a tiny projectile like a pecten used on a mandolin.

Has His Ear on His Elbow

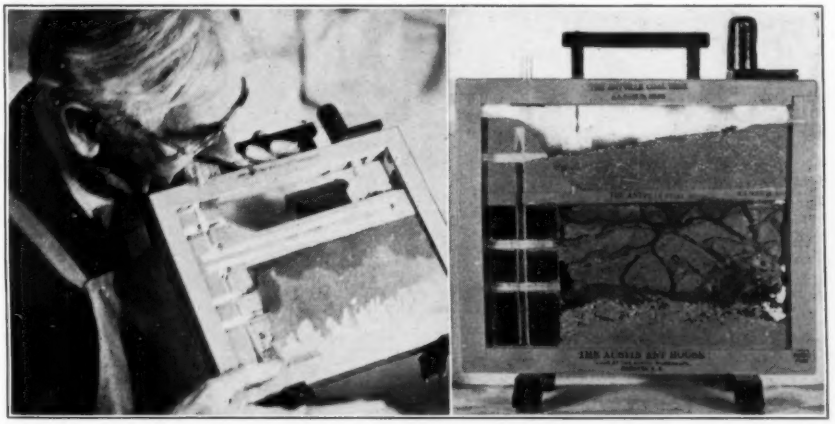
When Old Man Cricket or his young son wants to chirp he raises his wings to an angle of about 45 degrees and vibrates them one against the other. The pecten then rubs against the teeth and the chirp is the result. You cannot say that even though Father Cricket likes to hear himself sing, he cocks his ear, for his ear is nothing more than a tiny white spot on his elbow.

You can discover also that only men and boy crickets can chirp. Lady crickets and girl crickets simply haven't it in them.

Even though Mr. Austin has no more crickets, for crickets have been too scarce to supply the demand, does Mr. Austin despair? He does not. In his workshop he has a cricket incubator and starry-eyed mother crickets and swaggeringly proud papa crickets are raising four times the number of offspring they used to. Thus Mr. Austin improves on Mother Nature as we have her in New Hampshire: she requires three months to produce a full-grown cricket, with a full-grown chirp; Mr. Austin, only one.

But there is a disconcerting aspect to the ant and the cricket interest. Once you begin asking questions, you cannot stop. You might want to continue your discoveries and probe into the mysteries of the lives of bees and flies and toads.

Mr. Austin has a toad house too. But that is another story.



PUTTING ANTS TO WORK AND RESULT OF THEIR EFFORTS

Professor Austin blows the coal mine whistle and the miners start scurrying about, diving down the shafts in an effort to please their lord and master. At right may be seen the result of some months of excavating.

CHEMICALS

SPECIALLY PREPARED for EXTERMINATING WORK

Fluffy Sodium Fluoride 95/97%
DeHaen's Imported, or Domestic.
White and Tinted.

Rumetan (Zinc Phosphide)
For Rats, Mice and Mole Crickets.

Thallium Sulphate
Valuable Formula Hints on Request.

Sodium Arsenate C. P.
For Ant Extermination.

Deodo
Special Odor for Kerosene Sprays.

No-dor
A Chemical Odor Killer.

TECHNICAL MEMORANDA ABOUT THESE AND OTHER EXTERMINATING PRODUCTS GLADLY SENT ON REQUEST.

PFALTZ & BAUER, Inc.
EMPIRE STATE BLDG. - NEW YORK

McCormick's
PYRETHROL 20

Maximum Killing Power

A UNIFORM, standardized pyrethrum concentrate, with a guaranteed minimum content of 2.0 grams of pyrethrins per 100 cc.—equivalent to 2.4% pyrethrins. Controlled at all times by chemical assay—and checked by actual spraying on insects.

•

McCORMICK'S
PYRETHRUM POWDER
DERRIS POWDER CUBÉ POWDER

Finest ground powders of their kind in the world. Contain more killing particles per ounce. More effective and economical because they come into more intimate contact with vital parts of the insect's body.

For Further Information, write:
THE McCORMICK SALES COMPANY
BALTIMORE, MARYLAND

Chemical Attack Routs Clothes Moths

By J. A. BERNINGHAUS
General Manager of Sales, Monsanto Chemical Company

THE little girl who asked her mother what moths ate before Adam and Eve wore clothes received an evasive reply, but the question was not out of order, for nature in her scheme of things must have had in mind some more laudable role for moths than feeding upon our clothes. Scientists believe that before clothes became popular as moth fodder, these insects were scavengers and fed upon waste animal substances. In any case, somewhere in the distant past, moths took up their abode with early man who offered them a more comfortable and beneficial environment and ready supplies of food as moths like hair, wool, feathers, and furs as well as materials made from them. They also will feed upon dead insects, untreated skins, cobwebs, and dried bodies of rodents and birds.

This association of moths with man has continued down through the centuries. As man became more fastidious in his living, moths were more and more forced to look for their food in the fabrics and other materials which man quite rightfully regarded as his own possessions. These insects were well established as household pests in Biblical times and were in ill repute with the Romans and other ancient people. They have accompanied man on his travels and migrations. Moths are not indigenous to America but were brought here by Europeans and doubtless were uninvited passengers on the Mayflower.

Today we are in the odd position of giving moths the toughest battle they have ever had in their long contest with man while at the same time offering them an ideal environment in which to propagate and forage. Our comfortably heated houses and apartment buildings are much to their liking and permit them to breed and conduct their perforating rampages all the year round. Never before have they had such an elaborate menu, ranging from clothes and upholstered furniture to the felt pads of piano keys. Left to their own devices, moths could not travel far, but we aid them by transporting infested materials. We also build our dwellings close together, making long journeys unnecessary for them.

These apparent advantages, however, are offset by the fact that our knowledge of moths and their modes of living combined with the application of chemical knowledge provides us with powerful lethal weapons to use against them. With such equipment, there is no excuse for our permitting moths to do damage estimated variously between $100,000,000 and $200,000,000 each year in this country.

Two species of moths, the webbing clothes moth and the case-making moth, are the major offenders. A third species, the tapestry moth, is not as yet common and has not been recorded in many States. It is the larvae of these species that do the actual damage and not the adults which we see slinking to cover or flying furtively away when disturbed. The moths themselves do not live to eat and could not if they wished because their mouth parts are not suitably formed. They live briefly but to breed and die.

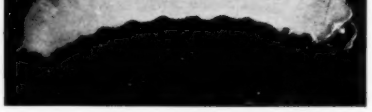
It is not difficult to distinguish the different species of clothes moths. The adult of the webbing and case-making moths vary in size but seldom have a wing expanse of more than one-half an inch. The former is light buff in color, with no markings on the forewings. The case-making moth may run to a grayish yellow color with three indistinct dark spots on the forewings. Tapestry moths are larger, attaining a wing expanse of three-fourths of an inch. The part of the forewing nearest the body is blackish.

Each generation of clothes moths passes through four distinct stages, namely, the egg, the larva or worm, the pupa or chrysalis, and the adult or moth. As stated, it is only the worm or larva that does the damage. The species take their common names from the manner in which the larvae work. The larva of the webbing case moth spins transparent coverings, sometimes cobweb-like, under which it feeds. The case-making species builds a portable tubular case within which it spends its larval and pupal life, increasing the size of the case as it grows. It spins little, if any, webbing upon the material on which it feeds. The larvae of the tapestry moth show a preference for heavy materials, mining in the goods or building tunnels or burrows running in all directions.

The webbing clothes moth is the most common of the three species. Its life cycle corresponds in the main to that of the others. The moth is the parent and its only function is reproduction. Within a few hours after leaving the cocoon, mating takes place and the female moth begins to lay eggs. She is equipped with an extended ovipositor that enables her to place her eggs in crevices, pile of clothing, and furniture covering. The eggs, which are very white, soft and fragile, may be laid almost anywhere. If the pile of fabrics is long and thick, the eggs may be laid deep down where they are not easily seen. On a closely woven piece of goods, they may be laid closely upon the fabric and can be easily shaken or brushed off. Although not as large as the head of an ordinary pin, the eggs can be detected by the naked eye.

The female moth may live for thirty or forty days, but her usual span of life is from ten to fourteen days. She may lay as many as three hundred eggs but one hundred is the more common number. When she ceases to lay eggs, she dies within a day or two. The eggs hatch in from four to eight days in summer weather or in heated quarters. In colder weather, hatching may take as much as three weeks. The eggs do not lie dormant for long periods as the embryos die.

From the egg, comes the larva, a worm scarcely one-sixteenth of an inch long. It immediately begins to feed and grow. At first, it is so transparent that the color of its food shows through its body. When fully grown, the larva is opaque, white and attains a length of half an inch, although many are much shorter. The nature of its food, the temperature, and humidity have pronounced effects on its growth. Sometimes, for no apparent reason, the larva will pass into a period of dormancy lasting as long as eight to twenty-four months. Later it will become active, feed and grow. It is not possible to judge the age of a larva by its size as some at fifteen months are smaller than others at two months. The shortest definite record for larval development is about forty days at 80°F., according to the United States Department of Agriculture.



Enlargement of mature larva of the webbing clothes moth. These larvae seldom exceed ½ inch in length, are chalk white with a brown or blackish head.

The larvae feed only on materials of animal origin and they must do enough eating to store up energy for the pupa and the adult moth. Linen, cotton, rayon, wrapping paper, and vegetable fibres are not eaten. Natural silk, although not vegetable, is seldom eaten.

The pupal or chrysalis stage, spent dormant in the cocoon, usually lasts from eight to ten days in summer temperatures and up to four weeks in winter in steam-heated homes. In this stage, no damage is done, the insect merely transforming from the larva to the adult or moth.

Thus each clothes moth passes through four stages in its life. The adult moth lays eggs from which the larva hatches. The larva does the eating for the whole life cycle and when it gets around to it spins a cocoon and changes to the pupa which in turn develops into the moth, sexually mature and ready to start the cycle all over

again. The length of the life cycle varies considerably, as we have noted. The minimum recorded by the United States Department of Agriculture was fifty-five days. The maximum was nearly four years.

In combating moths, there are several simple precautions which housewives can take as routine measures. Fortunately, the eggs of moths are fragile and the larvae cannot assimilate much physical punishment. Thorough beating, brushing, and sunning of clothes and furnishings twice monthly will as a rule keep materials free from injury. Garments worn several times monthly are not apt to be attacked. Eggs and larvae are removed when clothing is washed in a strong soap solution. They are killed by immersion for ten minutes in water at 140°F. Dry cleaning accomplishes the same end.

But the major damage is done by moths when clothes are put away for seasonal or other reasons. It should be remembered that moths in their various stages of development are present in modern homes all year around. For real insurance against damage, we must look to chemicals. One of the most effective of these in the killing of moths and in moth damage prevention is paradichlorbenzene. It is white crystalline chemical and is widely used in its pure form or as the main constitutent of moth killers. The vapor of paradichlorbenzene is non-poisonous to man but deadly to moths. Its odor is not disagreeable and quickly disappears from clothes when exposed to outdoor air.

Clothes and other materials subject to moth attack can be easily protected by a judicious sprinkling of paradichlorbenzene and then thoroughly wrapped in paper or placed in well sealed paper bags. Moths will not eat through paper and the vapors given off by the paradichlorbenzene assure death to any moths or larvae that may already be in the clothes.

There is nothing to the old idea that the ink in newspapers repels moths.

The use of paradichlorbenzene is effective in tight chests, drawers, trunks, and closets where the vapor will be confined. The amount to use to obtain absolute control depends upon individual conditions. In general, the equivalent of one pound to about seventy-five cubic feet of space is recommended. Temperature plays an important part. Moths, like many household insects, though active at 70°F. become inactive at 50°. This is probably due to the fact that their physiological processes are moving at high speed at the higher temperature but slow down at the lower. Hence, poisonous vapors are most effective at the higher temperature. In addition, the amount of toxic vapor given off by paradichlorbenzene that the air will hold at 70° or 75° is much greater than the amount it can contain at 50°. Thus, the higher temperature has a double advantage. Not only are the pests more susceptible but the concentration of the toxic gas is greater.

This matter of concentration emphasizes the importance of providing a really tightly closed space. An ordinary room closet may have tight walls, floor and ceiling, but it has a door, and the door has cracks. Leakage through these cracks constantly decreases concentration of the toxic gas. The cracks should be stopped up to allow the vapor to reach maximum concentration and to do its work. Upholstered furniture presents a different problem, but one which paradichlorbenzene solves. The plan to follow is to apply this product to the amount of about two or three pounds to the covering of a chair or piece of similar size, scattering it by hand down around the cushions, especially where they touch the back and sides of the piece, and into the spaces at the side and back. The inside should be made accessible for treatment wherever possible by loosening the covering on the back.

After application, the furniture should be covered immediately with some material that will retain the vapors. Blankets spread over the top and brought down to the floor serve the purpose. Wrapping paper or newspapers between the blankets assure greater concentration of the vapors. If the vapor is confined long enough and in sufficient concentration, all stages of the moth will be killed. It is a good idea to allow several days at summer temperature, although excellent results have been obtained by a two-day exposure in very warm summer weather.

White Mice Cost U. S. 13 Cents Each

Washington.—The research laboratory of the Public Health Service, which has been buying animals for biological purposes, expects to raise its own when housed in its new buildings at Bethesda, Md.

It bought in five months last year 15,257 white mice at 13 cents each. Ordinary mice won't serve the purpose. It also bought 4655 guinea pigs at 37 cents each, 1856 rats at 36 cents each, 672 rabbits at 83 cents each, 48 monkeys at $8.30 each and a dozen dogs at $1.50 each.

Specialists in

Highest Quality Tested Pyrethrum and Rotenone Products

John Powell & Co., Inc.
114 East 32nd Street
New York, N. Y.

MOTHS
BED BUGS
offer no serious service problems when you use
LETHANE 384
ALIPHATIC THIOCYANATE CONCENTRATE
POSITIVE ★ FAST ★ UNIFORM
RÖHM & HAAS COMPANY, INC.
Manufacturers of Chemicals
222 W. WASHINGTON SQUARE, PHILADELPHIA, PA.

When Writing Advertisers Mention the Log

Commercial Entomology as a Profession

By PROF. J. J. DAVIS, Purdue University

EDITOR'S NOTE: *The following remarks were made by Prof. J. J. Davis of Purdue University, in opening the session on Household Insects as a part of the meeting of the North Central States Entomologists' Conference, held at Kansas City, Mo., March 4-5.*

FOR PERHAPS 50 years or more commercial pest exterminators have operated in the larger cities with good to indifferent success although I believe the pioneers in this work were conscientious operators. Economic entomology as a science was itself just beginning to find its place at that time, and apparently the trained entomologist gave little thought or attention to the commercial exterminator. As the need for pest control in buildings in crowded centers of population became more evident, the numbers of exterminators increased, with an increasing number of untrained men attempting the work. Such conditions favored an increase in what has been called a racket in the exterminators' field, and with the marked interest aroused in termite control during the past decade, this racket has become still more evident. Until very recent years the entomologists have had little contact with exterminators and have not attempted to co-operate with or aid them. Similarly the exterminators have not attempted to contact or secure aid from the entomologists.

Only a few years ago an occasional entomologist, as George Sanders, George Hockenyos and Charley Denny, entered the commercial field. The value of their training in entomology was at once evident by the success which they soon achieved.

Again, only a few years ago, an organization known as the National Association of Exterminators and Fumigators, was organized, perhaps because of necessity as a result of the N. R. A. With competent and foresighted leaders, this organization has become the industry's standard bearer for better service, better training, and the elimination of the incompetent operator. Entomologists may have given a little co-operation but it was essentially this group of exterminators themselves that recognized the faults of the industry and the need of changes to give pest control a professional standing.

The speaker's interest dates back perhaps two years. A year ago in November I was a visitor at the annual meeting of the National Association of Exterminators and Fumigators held in Detroit. I desired first hand information on the type of men in the organization, and above all to learn whether it was desirable for entomologists to co-operate with them, whether the entomologists would be welcomed, and how we might co-operate and be of service. I met an intelligent group of men, evidently interested in improving their profession, although I gleaned an impression that some were of the opinion that the entomologist might be attempting to dictate to them. The following year (November, 1936) I was invited to speak before that Association at its annual meeting in Cleveland. I had become thoroughly interested in the work of these men who were endeavoring to maintain and improve standards of pest control and I took as my topic, "The Goal of the Pest Control Operator." In concluding my remarks, I urged co-operation between exterminators and entomologists which could best be inaugurated by a committee of the exterminators meeting with a similar committee of the entomologists. This has been done, and with Prof. W. P. Flint chairman of the entomologists' committee, the first joint meeting was held in Atlantic City last December. That this co-operation is desirable is attested by the fact that a standing committee of the economic entomologists has been approved, to co-operate with the exterminators. Far-reaching activities may be anticipated. Incidentally I also spoke of our intention to hold a short course or conference for Indiana pest control operators. This idea was apparently in line with the thoughts of the exterminators for they had already inaugurated as a feature of the Cleveland meetings a series of clinics dealing with the several household pests. At the suggestion of the National Association of Exterminators and Fumigators we gladly opened the Indiana conference to all exterminators, although no publicity was given other than that sent out by the National Association.

Previous to this time we had canvassed the operators in Indiana as to the time and length for such a conference. In general, January and February were satisfactory months, and although one or two indicated 2 or 3 days as the desirable length of the course and a few specified two or three weeks, by far the majority said one week. Thus, we planned on a five-day conference in January of 1937. We expected 30 or 35 to attend. To our amazement 81 from 14 states registered. Furthermore, all three past presidents of the National Association of Exterminators and Fumigators, and the present president, attended.

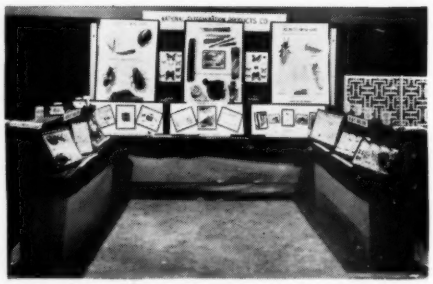
We had no precedent upon which to base our program of activities. From suggestions received from exterminators and from our own observations as to the needs of the industry, we outlined a program. We gave considerable time to the fundamentals of insect life, insect identification and insect control. This was followed by several half-day clinics on several major household pests. Apparently we succeeded in providing in this initial conference the topics desired. I was especially surprised at the intense interest in the half-day spent in the laboratory on insect identification, and the realization by those present of the importance of being able to recognize not only the common household pests, but other insects in or about the home regardless of their economic importance.

That the pest control industry is becoming a profession of high standing there can be no doubt. No one who attended the conference and observed the perfect attendance, the intense interest, and careful thought of all present, could decide otherwise. I have never seen a more interested group of men at any meeting. And, finally, may I say that the numerous letters received since the conference expressing appreciation, and above all the growing interest and continued study of insect publications, is ample evidence of the real interest of exterminators to improve their industry.

What are the results of this pioneering conference. It has demonstrated the need and value of such conferences; that exterminators appreciate the information available through entomologists; the value of close and cordial association and cooperation with fellow workers; an interest has been aroused which will serve as an incentive for further knowledge of insects; entomologists have been aroused to a realization that more research on household insects is urgently needed; and, finally, I am not sure but what it has been partly responsible for the program on household insects arranged for this session of the North Central States Entomologists' Conference.

And, finally, may I say a word regarding the outlook for trained entomologists in the field of pest extermination. Many commercial concerns are asking for trained entomologists. They appreciate the need of trained men and the prestige of having such men on their staff. However, entomologists should themselves appreciate the need of practical experience and even though they have technical entomological training, they can scarcely expect to embark in the business of pest control without the training which only practical experience will give. The opportunities for expanding the field of pest control are great, the field is wide open for the entomologist, and there is ample room for all who are properly qualified.

Another Good Way to Advertise



This exhibition was shown at the Kansas City, Mo., Better Homes and Flower Show at the Municipal Auditorium, February 20-27, 1937, by one of our members.

Alley Cat Set to Catch a Mouse Catches Itself in Kitchen Stove

Printed in Brooklyn Times-Union, March 3.

Police Emergency Squad 16 of the Herbert Street station could have avoided a great deal of trouble early this morning, if it had volunteered last night to catch a mouse for Mrs. Mary Molina of 309 Menahan Street.

Mrs. Molina has a mouse as an unwanted kitchen guest. Last night she enticed an alley cat into the room and then went to bed.

At 8:30 this morning she was awakened by a loud yowling.

The cat had assailed the stove, and discovering a hole halfway up, obstructed by ising-glass forced its head in and there it stuck.

Patrolman Edwin Carney with Emergency Squad 16 released the cat after dismantling the stove. The feline alleyist will be sent to the S. P. C. A.

Mrs. Molina will probably buy a trap—or call an exterminator.

Local Organization News

Northwestern Association

A special noon luncheon meeting was held at Cafe Exceptional, Minneapolis, on Wednesday, March 9, in which the following members met:

M. J. Levy, Twin City Exterminating Co.
G. T. Athelstan, Athelstan Products Co.
G. T. Athelstan, Jr., Athelstan Products Co.
E. H. Leitle, Fumigation Service Co.
Wm. O'Reilly, Plumkett Exterminating Co.
A. Vannes, Troostwyk & Vannes.
Mr. Armour, Rose Exterminating Co.
H. V. Smith, H. V. Smith & Co.

Al Cossetta, Exterminators Log, as an honorary guest, met with the local group.

After luncheon very interesting problems were discussed as to how to better the profession as well as to work along together in educating the public as to the importance of pest control service.

Mr. Cossetta brought out several splendid suggestions as to the best policy in dealing with prices, complaints and service, and how to cooperate to bring the best results. The importance of the Purdue Course was impressed upon our minds as to the valuable information and help obtained, also the coming convention to be held at Memphis.

It was a real treat to have our energetic and live wire editor to meet with us. His good counsel and advice were indeed an inspiration and were appreciated, and we only wish that he could meet with us again.

New York City

Associated Exterminators and Fumigators, Inc.

The regular monthly meeting was held at the Association headquarters, General Motors Building, Thursday, March 11, with an attendance of twenty five firms. President Buettner presided and told of his recent trip augmented by movies. Vice-President Merwyn Horwitz also showed movies of his recent trip.

Discussion centered mainly on the matter of unethical selesmanship and competition. General information was gathered preparatory to a report which is to be submitted at the April meeting at which a definite plan is to be offered.

Possible revisions of Section 104 of the Sanitary Code under which the industry is governed in New York City were taken up and further recommendations offered. The next meeting is to be held Thursday, April 15.

Kansas City Association

During the Entomologists' meeting in Kansas City, the local group was called to meet at Baltimore Hotel for a luncheon meeting on Friday afternoon, March 5.

The attendance, including the honorary guests, was 17. Those present were: Prof. J. J. Davis, Purdue University, Head of Department of Entomology; Dr. V. Roark, U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Washington, D. C.; Dr. W. P. Flint, University of Illinois, Urbana, Ill.; Dr. L. Haseman, University of Missouri; Dr. C. H. Richardson, State College, Ames, Iowa; Dr. C. L. Metcalf, University of Illinois, Urbana, Ill.; W. E. McCauley, University of Illinois, Urbana, Ill.; Miss Olive Falls, Entomologist, The Antimite Co., St. Louis, Mo.; Charles Denny, Entomologist, Chas. Denny & Co., St. Louis, Mo.; Thomas C. Raley, Getz Exterminators, St. Louis, Mo.; Chas. Bedingfield, Getz Exterminators, Kansas City, Mo.; A. L. Linck, Paramount Fumigation Co., Kansas City, Mo.; C. I. Ragan, C. I. Ragan & Co., Kansas City, Mo.; Geo. W. Rockwell, Rockwell Exterminating Co., Kansas City, Mo.; F. R. Andrews, Fumigation Service Co., Kansas City, Mo.; D. Reck, Harrower Laboratories, Kansas City, Mo., and Al Cossetta, Exterminators Log.

Mr. Bedingfield, president of the local association, expressed the appreciation of having the honorary guests meet with the group. Mr. Denny introduced Prof. J. J. Davis as the speaker.

Professor Davis, in his remarks, brought to our minds the interest that was shown at Purdue by the pest control operators.

These New Booklets Describe
Penick's Laboratory Tested

ROTENONE - SQUILL - PYRETHRUM

Available upon Request

S. B. PENICK & COMPANY
132 NASSAU STREET
NEW YORK, N. Y.

Phosphorus Paste for Pests

A specific insecticide for the large, brown, American roach and the black Oriental roach or water bug. Many exterminators say our Phosphorus Paste for Pests is the most effective, economical, and specific treatment they have ever used against these pests.

Phorphorus Paste for Pests is also an effective exterminator of rats and mice.

PRICES
Regular or Nile Blue Color

10 lbs.	$4.25	50 lbs.	$17.00
25 lbs.	9.00	100 lbs.	32.50

MIXED POISON GRAINS — Anise Scented
A four seed mixture consisting of Barley, Hemp, Rye and Wheat.

10 lbs.	$4.00	50 lbs.	$12.00
25 lbs.	7.00	100 lbs.	22.00

SENCO 'G' MIX FOR MICE — Anise Scented
A Four-seed, Green Colored Mixture.

10 lbs.	$4.00	50 lbs.	$12.00
25 lbs.	7.00	100 lbs.	22.00

POISON HEMP SEED (Green) — Anise Scented

10 lbs.	$4.00	50 lbs.	$12.00
25 lbs.	7.00	100 lbs.	22.00

POISON WHEAT (Red) — Anise Scented

10 lbs.	$4.00	50 lbs.	$11.00
25 lbs.	6.00	100 lbs.	20.00

FREIGHT PREPAID

Sennewald Drug Company, Inc.
800 HICKORY STREET ST. LOUIS, MISSOURI

Words could not express the value of the course and the appreciation felt by those who attended. Also the need of cooperation from our industry with the Entomologists, who are more than willing to work with us. After the luncheon, the local group met together to discuss a few problems. Mr. Denny took charge of the meeting. The discussion as to how operators could work together and raise the standard of ethics was brought out in a very forceful way.

Much interest was manifested and as a whole the meeting proved to be very profitable. Mr. Denny impressed upon our minds how we could make the future round table luncheons very interesting and offered several splendid suggestions as to working together for the good of the industry. This was very much appreciated and the local group is looking forward to getting together in the near future for another interesting meeting.

Newark, N. J., Association Holds Meeting

The Professional Exterminators and Fumigators Association of Newark, N. J., held their meeting at 790 Broad Street Monday, March 8. Al Arndt, President, presented the revised Newark ordinance and decision was reached as to changes that would be requested.

Protest is to be made by appearing before the State Assembly Committee as to the proposals of Assembly Bills No. 174 and No. 213. The former would eliminate fumigations with HCN entirely, while the latter imposes undue hardships upon the industry.

William O. Buettner, Secretary of the National Association was the guest of the evening and assisted in the discussion on legislation.

National Association Notices

Members are urged to call on each other, especially when traveling about the country. A permanent office is not required, but for those firms visiting New York City, it is urged that the secretary be called at either South 8-4116 or South 8-4120 and appointment will be arranged.

Communication No. 78 — Mailed to the membership March 29 and continues with questions and answers on Fumigating operations and other service material.

Communication No. 79—Official letter to the Board of Directors mailed April 3 on the usual matter of business of the Association.

Communication No. 80—Will be mailed to membership middle of April and include additional names added to membership as well as interesting data.

Membership is over 350 now and several applications have been received. Any firm interested should write to the Secretary, at 3019 Ft. Hamilton Parkway, Brooklyn, N. Y. See title page of The Log.

Memphis, October 25-26-27 — Indications are that it will be the largest convention thus far held. Plan early by reserving dates. Martin Meyer, 213 E. 10th Street, Philadelphia, Pa., will assist with matters of transportation and travel. Inquire about possible reduced fares and other conveniences.

Service—The Association again offers to assist firms who desire to ask any questions.

Small and Large Cuts of the Seal: If you are not using these on your letter heads and other general advertising, we urge that you begin immediately. Send $1.00 to the seretary today before you forget it.

Newark, N. J., Legislation

The following is a copy of proposed local ordinance for the City of Newark, N. J. which will probably be adopted. In connection therewith it will be noted that there is no cumbersome licensing system with excessive fees but the real purpose is to provide the means whereby there is a definite control over the people actually engaged in fumigation operations. It would appear that the Health Commissioner has unusual powers to promulgate regulations but these powers must be in accord with a state law dealing with the New Jersey Health Act, Section 12, making it necessary for such regulations to be published and consideration given for hearings.

An Ordinance to Regulate and Control Fumigation By Poisonous Gases, and Providing Penalties for the Violation Thereof

The Board of Commissioners of the City of Newark Do Ordain:

1. No person, persons, firm, partnership or corporation shall use any fumigant for fumigation or disinfection within the corporate limits of the City of Newark unless such person, persons, firm, partnership or corporation shall have previously obtained from the Health Officer of the City permission to do so.

A. The term "fumigant" as used herein shall mean and include any substance which by itself or in combination with any other substance emits or liberates a gas, fume or vapor used for the destruction or control of insects, fungi, vermin, rodents, or other pests, and shall be distinguished from insecticides and disinfectants which are essentially effective in the solid or liquid phases.

The term "persons" as used herein includes corporations and co-partnerships as well as individuals.

2. The Health Officer of the City of Newark is authorized to forbid or outline the conditions under which such fumigation or disinfection may be permitted to be done in the City of Newark.

3. Any person, persons, firm, partnership or corporation violating the provisions of this ordinance shall upon conviction thereof, be liable to a penalty of not more than $100.00, or not more than 10 days in jail, for each and every offense.

4. All ordinances and parts of ordinances inconsistent with the provisions of this ordinance be and the same are hereby repealed.

5. This ordinance shall take effect immediately upon final passage and publication according to law.

Capt. D. B. Castle Appointed to California Structural Pest Control Board

The Pest Control industry is watching with interest the progress being made in the state of California which is the only state having statewide legislation for our industry. There are under consideration at the California State Legislature several amendments to the present act and subsequently this will be commented upon. The consensus of opinion is that the Structural Pest Control Law has more than justified itself in bringing about a better understanding in the industry in that a higher type of operator engages in pest control operations and there are sufficient teeth in the law so as to make it necessary for pest control operators to perform services in a manner to conform with promises or "guarantees" that are given. Thus the pest control operator as well as the public is protected.

In charge of the Structural Pest Control Act or Law is the governing body known as the Structural Pest Control Board. The industry is represented by three of the six-man board. M. G. Jorgenson of Jorgenson & Co. of Los Angeles, is chairman, and last year Wilbur F. Smith of The Alderman Co. of Pasadena, Calif., was appointed for a three-year term. The third member recently

California Exterminators and Fumigators Convention

The Group Attending the California State Convention Held at San Jose, February 12th and 13th

appointed for a term of three years is Captain D. B. Castle. May we introduce Captain Castle to you?

Born in New York City, September 18, 1882.

Graduated from public school, high school and Columbia University in New York City.

Followed the sea for a livelihood through the various grades from seaman to captain, after leaving college.

In 1912 served as captain in the Inter Island Steam Navigation Co. of Honolulu, promoted to marine superintendent in 1913, remained in this position until 1916, then returned to the Matson Navigation Co., remained with them until the World War, then joined the United States navy as lieutenant commander and was assigned to duty as executive officer and navigator of the destroyer Paul Jones, then detached from Paul Jones and ordered to duty as supervisor of naval auxiliaries on the West Coast, stationed in San Francisco, Calif., in this position as supervisor; he had charge of all naval auxiliary activities including the enrollment of their officers and crews in the territory from Canada to Mexico, and from Denver, Colo., to the Philippine Islands, during this period; he placed 206 ships built in shipyards on the Pacific Coast in commission, loaded them and dispatched them to the war zone.

After being released from the navy in 1919, he returned to the Matson Navigation Co., remaining with them until he entered the fumigating business in 1929.

Captain Castle belongs to the American Legion, the Veterans of Foreign Wars, the Alameda, Calif., Lodge No. 1015, B. P. O. E., and the Bethlehem Lodge of the A. F. & A. M., of San Francisco, Calif., and is now president of the American Marine Fumigating Co., Inc.

Picked Up From Here and There

We offer our condolences to the family of Mr. A. Kapson of Chicago on the death of Mrs. Kapson. We likewise extend our sympathies to Mr. David Blum and family in the loss sustained through the death of Mr. Blum's brother, Barney. Mr. Kapson is the owner of the A. & B. Exterminators of Chicago. Mr. Barney Blum was associated with his brother in the Gem Exterminating Co. of New York City.

Mr. Max Levy, "Downtown Quarterback" of the Minnesota football team included a rather pithy paragraph in a recent letter: "Please do not mention about the sacrifice I am making in regard to the trip to the Memphis Convention next October inasmuch as I have arranged with the University of Minnesota so that they are scheduled to play Michigan on October 16 to which game Mrs. Levy and myself expect to go. From there we hope to go to New Orleans for a few days and proceed to Memphis to be there early. You see Saturday, October 23, has been conveniently set as a free day for the Minnesota team. Can you beat that one?"

The National Association of Exterminators and Fumigators is making vigorous protests against rodent control campaigns that are taking business away from our industry. In Chicago there are some 850 men, so it is reported, going from property to property offering to do work free of charge. Every firm in the industry might well write letters to their local representatives and senators at Washington, D. C., against this sort of program that deprives us of legitimate business. Even if you are not hit now, it is almost a duty to protest so as to prevent a possible campaign of this nature in your city.

Omaha, Nebr., reports that the coming classified telephone directories will show all listings of firms of the industry under "pest control." This will allow for better advertisements in that firms no longer need think of having their names under each of a dozen listings. The number of listings merely tends to confuse the public.

While on the subject of Omaha, Nebr., John Linn is suggesting that the general meeting place for all firms traveling westward for the 1938 convention in California should come via Omaha from which point the Union Pacific will take good care of our travelers. But before we start for the 1938 convention, we want to remind you that this year we are meeting at Memphis, Tenn., October 25-26-27.

Congratulations to Mr. and Mrs. Chester Schwimer of Jamaica, Long Island, N. Y., on the arrival of a baby daughter on March 11. Mr. Schwimer is associated with Herbert Meyer in the firm of Fumex Sanitation, Inc., of Jamaica, Long Island.

At Kansas City, Mo., Thos. C. Raley of Getz Exterminators, Inc., and the National Extermination Products Co., tell of dis-

CALICO SEED

Kills All Mice

CALICO SEED is a remarkable new mouse killer that exterminates mice quickly, cheaply, efficiently . . . It utilizes a new chemical process . . . Lures mice and kills quickly.

No objectionable after odors . . . Ready for immediate use . . . No mixing required . . . Guaranteed to kill all mice in 3 to 4 days.

Exterminators have secured very good results using CALICO SEED. Names of users on request.

Industrial Size. 10 Pounds $4.00; 25 Pounds $7.00; 50 Pounds $12.00; 100 Pounds $22.00; all f. o. b. Kansas City. PACKED IN 8-OUNCE POUR SPOUT CANS.

Satisfaction guaranteed or money refunded

THE BAGNALL COMPANY

STATION A KANSAS CITY, MO.

Dependable★ Killing Power

DI-BUG PRODUCTS

★Dependability is a constant characteristic of SHERWOOD'S DI-BUG Pyrethrum Extracts and Powder. All DI-BUG Pyrethrum Products are tested by Chemical Assay (Dr. Seil's Method) and Biologically by the new Evaluation Method adopted by the National Association of Insecticide and Disinfectant Manufacturers, Inc.

★DI-BUG PYRETHRUM EXTRACTS are made with Spraysene Odorless Base. They are sold on the following guaranteed minimum Pyrethrin Contents:

No. 30 (mix 1:30)	3.6% Pyrethrin
No. 20 (mix 1:20)	2.4% Pyrethrin
No. 5 (mix 1:4)	0.6% Pyrethrin

★DI-BUG PYRETHRUM POWDER (Finest Japanese Impalpable.) Sold on a guaranteed minimum Pyrethrin Content of 0.9%.

WRITE TODAY FOR LITERATURE

SHERWOOD

PETROLEUM COMPANY, INC.

Main Office: Bush Terminal, Brooklyn, New York

Stocks Carried in Principal Cities

tributing over 30,000 folders while exhibiting at the Home Show.

Mrs. Harriet Mast, owner of Master Exterminating Co. of Akron, Ohio, reports that she is well pleased with the reception given her booth at the Home Show.

Bill Phippard of the Wilmar Co. of Cincinnati, Ohio, claims he is having a hard time to get back to earth after a pleasant sojourn in Florida.

The proposed Assembly Bills No. 174 and No. 213 of New Jersey, which would govern our industry in that state, are being severely protested.

California is in the middle of a heavy program of legislation, having as its purpose that of amending certain parts of the present Structural Pest Control Law. M. G. Jorgenson, chairman of the board, has taken up headquarters at Room 311, Sacramento Hotel, Sacramento, Calif., that he might appear before necessary committees to aid the industry in having the license fee increased to $25.00 that a permanent inspector might be had in the field to assist with enforcement of the law. Other proposals include better definitions as to "household," "operator," "establishment" and "branch establishment." Especially is it being requested that any person in charge of a branch office should be a duly qualified person who will have met the requirements of a licensed operator.

Prof. J. J. Davis was the speaker before the Hammond, Indiana, Chamber of Commerce at their March meeting taking as his subject "Pest Control". Arrangements were made by J. R. Franklin of the Hammond Exterminating Co. Eight firms from Chicago, Ill., made the trip so as to listen to Prof. Davis.

C. Norman Dold has been on a trip through the south the latter part of March. While at Atlanta, Georgia, Mr. Dold met with the pest control operators. The trip also afforded an opportunity for him to visit with his mother who resides at Orlando, Florida.

The March issue of the Review of Reviews published an article under the caption "Pied Pipers, Inc." We recommend this for your reading.

Drs. R. E. Chamberlain and Wilton Ivie of the University of Utah, at Salt Lake City, Utah, have collaborated on a monograph entitled "The Black Widow Spider."

Rumor has it that the surprise party given Robert W. Loibl, March 24, caught him napping, thinking that more bees wax should have been used. Bob as you will recall was the energetic chairman of the California State Convention held at San Jose February 12 and 13.

The McCormick Sales Company of Baltimore, Md., announces the appointment of Harry C. Sanner, Jr., as manager of their West Coast office at San Francisco.

The Exterminating Service Corporation of New York have enlarged their offices and personnel due to increased business.

Black Widow Spider Bad? Pooh! Keep in Woodpile!

Black widow spiders deadly? Dangerous to have around the premises?

Dr. H. A. Allard, scientist in the U. S. Department of Agriculture, pooh-poohs the whole idea. (Science, Jan. 15.)

Black widows are poisonous; that he does not dispute. They can make you sick if they bite. The joker is, they almost never bite.

Years ago, says Dr. Allard, he found the spider very abundant in northern Georgia. Doubting its poisonousness, and willing to play guinea pig himself, he tried to make it bite him on the thin skin between his fingers. The obstinate arachnid would not bite.

"On collecting trips as many as five or six were carried in the closed hand on several occasions with no effort on their part to bite," Dr. Allard continues. "The writer has liberated swarms of the young in an old woodpile near his garden, with no fear of being bitten. Much has been written within recent years about the evil ways of this spider, but there is little reason to fear its attacks and no reason to wish that it could be exterminated."

Black widows apparently have the strongly developed maternal instincts often attributed to their human namesakes. At any rate Dr. Allard states that they will adopt the cocoons containing the spiderlings of other females of their species. "If one is dropped on the floor of a box with a female she proceeds to suspend it in a web and watch over it. The process is repeated if others are dropped about, showing a rather marked solicitude for the nest."—Science News Letter, February 6, 1937.

AWAY AHEAD IN DUST PROTECTION AND COMFORT

M·S·A Comfo RESPIRATOR

U. S. Pat. No. 2,019,928

PROTECTION, even against *invisible* dust, plus lightweight comfort, effortless breathing and unrestricted vision have made the M.S.A. Comfo Respirator a country-wide favorite. Two types are available, *both U. S. Bureau of Mines-approved:* one for silica and other pneumoconiosis-producing dusts and chromic acid mists; the other for lead dust. ● Let us demonstrate the Comfo Respirator on your own jobs—there's no obligation.

MINE SAFETY APPLIANCES CO.

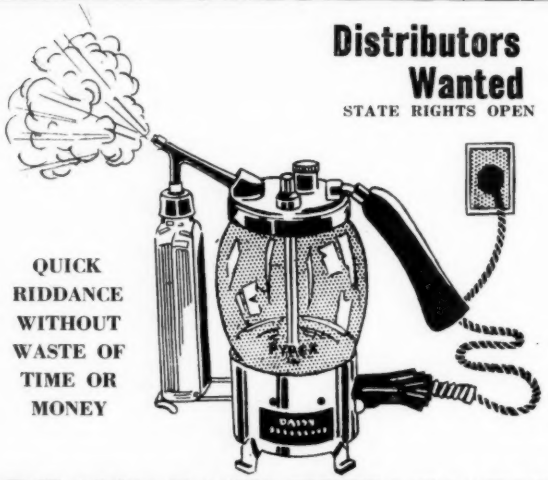
Braddock, Thomas and Meade Streets, Pittsburgh, Pa.

District Representatives in Principal Cities

M.S.A. Products include Breathing Apparatus . . . Inhalators . . . Comfo Respirators . . . Masks of all Types . . . Gas Indicators . . . Gas Detectors . . . Safety Goggles . . . Protective Hats and Caps . . . Edison Electric Cap Lamps . . . Safety Clothing . . . First Aid Equipment. Descriptive Bulletins will be sent on request.

Distributors Wanted

STATE RIGHTS OPEN



QUICK RIDDANCE WITHOUT WASTE OF TIME OR MONEY

THE NEW DAISY EXTERMINATOR

by far surpasses any Steam Vaporizer on the market today.

This machine requires no special treatment of water. Ordinary drinking water will do.

Its super heated nozzle does more than atomize. It gives greater vaporization with attending increased efficiency and room spread.

LIST PRICE $9.80 — YOUR COST $4.90

Order one machine and convince yourself of its great possibilities. Satisfaction absolutely guaranteed or money refunded if returned within ten days. Order by express or parcel post.

We can furnish Daisy Misto, the liquid for this machine, at $3.00 per gallon. List price, $6.00.

ACT NOW — Write at Once to

THE DAISY COMPANY

2606 TROOST AVE. KANSAS CITY, MO.

Additional Patents Relating to Pest Control

By DR. R. C. ROARK

EDITOR'S NOTE: *This service is provided through the Department of Agriculture for the purpose of bringing to the attention of those interested such matters that may be of assistance to the industry. The Department of Agriculture assumes no responsibility for the merits or workableness of any of the inventions mentioned. Copies of all patents can be obtained for 10c (no postage stamps) sent to the Patent Office, Washington, D. C. When placing orders be sure to note the number of the patent, the date, the name of the patentee and the subject of the invention.*

2,066,453 (Jan. 5, 1937; appl. Oct. 14, 1935, in Great Britain, Nov. 6, 1934). PRESERVATIVE FOR ANIMAL AND VEGETABLE SUBSTANCES. John Bleeck, London, England. A process for preserving animal and vegetable substances consists in treating said substances with an aqueous solution of sodium sulphate and sodium fluoride (neutral or acid) with kaolin suspended therein, the quantity of sodium sulphate (in terms of the decahydrate) constituting at least 30 per cent of the solid ingredients and the quantity of sodium fluoride at least 2 per cent thereof.

2,066,583 (Jan. 5, 1937; appl. April 29, 1933). METHOD OF PRESERVING WOOD. Grant B. Shipley, Pittsburgh, Pa. The patentee claims in a method of preserving wood by impregnation with a preservative, that step comprising impregnating the wood with wood-preserving impregnant comprising the undistilled whole of the tarry oil recovered from the condensing system of a by-product coke oven separately from the heavy tar deposited in the hydraulic main, said tarry oil having an absolute viscosity of 2.47 centipoises at 185° F. and a distillation residue of about 33.5 per cent above 355° F., and high weatherproofing power.

2,066,607 (Jan. 5, 1937; appl. Sept. 11, 1933). APPARATUS FOR TREATING AND DIFFUSING PYRETHRUM. Walter S. Burgess and Earl K. Golley, Benton Harbor, Mich., The O. & W. Thum Company, Grand Rapids, Mich. This apparatus mixes pyrethrum solution and steam in the proper proportion for best killing of insects and diffuses the mixture in an infested area. With this treatment, one ounce of 1 per cent solution of pyrethrum will, when treated with three ounces of water converted to steam, effectively treat a room of 10,000 cubic feet capacity.

2,066,737 (Jan. 5, 1937; appl. June 10, 1935). MAKING PYRETHRIN INSECTICIDE. Irving E. Muskat, Pittsburgh, Pa., Gulf Research & Development Company, Pittsburgh, Pa. A method of making an extract of pyrethrum flowers in petroleum distillate for insecticidal purposes comprises immersing the flowers in the distillate in a ratio between $2\frac{1}{2}$ and 0.1 gallons of distillate per pound of flowers and for a time less than one hour and separating the liquid extract from the residue of flowers.

2,066,895 (Jan. 5, 1937; appl. Jan. 19, 1934; in Germany, March 31, 1932). WATER-SOLUBLE SEED DISINFECTANT. Karl Memminger, Magdeburg-Sudost, Germany, Fahlberg-List Aktiengesellschaft Chemische Fabriken, Magdeburg-Sudost, Germany. A non-decomposing water-soluble disinfectant for wet treatment of seed comprises an insoluble cresol mercuricyanide, trisodiumphosphate forming an intermediate solvent and preservative vehicle for the mercuricyanide in the presence of water, and means cooperating with said trialkaliphosphate and enhancing its office as a vehicle, comprising an alkali-para-toluenesulphonate.

2,066,941 (Jan. 5, 1937; appl. July 9, 1935). INSECTICIDE AND PROCESS FOR MAKING THE SAME. Louis N. Markwood, Washington, D. C. Dedicated to the United States Government and the People of the United States. The patentee claims the water-soluble product of the reaction between nicotine and peat. This is made by treating peat with an acid from the group consisting of mineral acids and acetic acid, washing said peat to remove soluble matter, bringing together in intimate contact

Monarch Powder Sprays

Used by Many Leading Exterminating Concerns Throughout the Country

Made in 3 Sizes

No. 40 Has 14 Ounce Capacity

No. 41 Has 9 Ounce Capacity

No. 42 Has 8 Ounce Capacity

Large Opening in Neck Affords Easy Filling

Screens Powder Perfectly

Made of High Grade Materials

Write for Catalog and Price List

THE VANT WOUD RUBBER CO.

JERSEY CITY, - - - - NEW JERSEY

ATTENTION EXTERMINATORS

Immediate *Permanent* *Economical* *Safe*

CALPRO ANT SYSTEM

Used Successfully Since 1919

Now Available - Wholesale Only

CALPRO SALES COMPANY

Beverly Hills, California

BARBASCO ROOT

For the best roots yielding a high percentage of ROTENONE; guaranteed not less than 5%, demand:

"RECREO"

Brand . . . Shipped by

The Paranapura Cube Export Company

Iquitos, Peru

H. A. ASTLETT & COMPANY

64 Water Street - New York City

Sole Selling Agents in the U. S. A. and Canada

When Writing Advertisers Mention the Log

an aqueous solution of nicotine and said peat, and separating the liquid portion.

2,066,946 (Jan. 5, 1937; appl. March 8, 1934). DEODORIZING AND STERILIZING BANDAGE. Clarence K. Reiman, Newton, Mass. Calcium hypochlorite is used as a sterilizing agent.

2,067,046 (Jan. 5, 1937; appl. Aug. 31, 1934). TOXIC AGENT AND ITS APPLICATION TO FIBROUS PRODUCTS. George H. Ellis, St. Paul, Minn., The Insulite Company, Minneapolis, Minn. The patentee claims a method of rendering vegetable fiber products insect and fungi-proof, wherein the insect and fungi-proofing properties are obtained through addition to fibers in a water bath of an emulsion containing hydrocarbons of the general formula C_nH_m, creosote and its homologues, pyridin-like substances in amount less than 0.5 per cent and rosin.

2,067,047 (Jan. 5, 1937; appl. June 29, 1935). INSECT AND FUNGI TOXIC FIBROUS MATERIAL. George H. Ellis, St. Paul, Minn., The Insulite Company, Minneapolis, Minn. The patentee claims a vegetable fiber product sized and rendered toxic by commingling with fibers in a water bath a solution resulting from interaction of a toxic agent containing hydrocarbons of the general formula C_nH_m, creosote and its homologues, and pyridin-like substances in amount less than 0.5 per cent; a caustic material, and a sizing material.

2,067,547 (Jan. 12, 1937; appl. June 28, 1935). GARBAGE DISINFECTING DEVICE. Louis Schneider and Najam Modad, Carbondale, Pa. An improvement over 1,928,864.

2,067,606 (Jan. 12, 1937; appl. April 9, 1936). MANUFACTURE OF ALKALI THIOCYANATES. Edward L. Helwig, Bristol, Paa., Rohm & Haas Company, Philadelphia, Pa. A process of preparing alkali thiocyanates comprises heating a suspension of zinc cyanide in an aqueous alkali carbonate solution with at least one of the group consisting of sulfur and an alkali thiosulfate.

2,067,674 (Jan. 12, 1937; appl. Nov. 25, 1935). GERMICIDAL COMPOSITION AND PROCESS FOR PREPARING THE SAME. Harold B. Kimerlin, New York, N. Y. A composition adapted for use as a germicide, comprises a detergent and a mercury compound obtainable by reaction of a double iodide of mercury and a compound belonging to the group consisting of a glycol and a glucol-ether at a temperature and a pressure above atmospheric.

2,068,211 (Jan. 19, 1937; appl. Dec. 31, 1934). FLY SWATTER. James G. Wasson, Baltimore, Md., Gatch Brush & Wire Goods Company, Baltimore, Md.

2,068,492 (Jan. 19, 1937; appl. April 22, 1935). ANIMAL TRAP. Frank T. Johnson, Elgin, Ill. One-half to Edgar C. Guthard, Chicago, Ill.

2,068,508 (Jan. 19, 1937; appl. June 29, 1933; renewed July 27, 1935). ANIMAL TRAP. Walter L. Orr, Los Angeles, Calif., Edgar G. Guthard, Chicago, Ill.

2,068,656 (Jan. 26, 1937; appl. June 24, 1936). TRAP. Frank R. Conibear, Victoria, British Columbia, Canada.

2,068,742 (Jan. 26, 1937; appl. Jan. 6, 1933). INSECTICIDE. Charles B. Gnadinger, Minneapolis, Minn. A process for producing an insecticide consists in adding three ounces of selenium to one gallon of calcium polysulphide solution. A process for forming an insecticide consists in dissolving three ounces of selenium in one gallon of commercial lime sulphur, emulsifying a spray oil with calcium caseinate and adding one-third of a gallon of this emulsified oil to one-sixth of a gallon of the lime sulphur selenium solution, then adding one hundred gallons of water.

2,068,865 (Jan. 26, 1937; appl. Sept. 30, 1933; renewed January 29, 1936). ANIMAL TRAP. Sebastian P. Neuhausen, Lombard, Ill., Stampit Corporation, Lombard, Ill.

2,068,871 (Jan. 26, 1937; appl. Nov. 30, 1934). POWDER SPRAYING DEVICE. William H. Rose, Jersey City, N. J., Stanco Incorporated.

2,069,036 (Jan. 26, 1937; appl. April 11, 1934). FUMIGATING COVER FOR A CONTAMINATED MATTRESS. William Howard, Jr., Santiago, Chile.

2,069,076 (Jan. 26, 1937; appl. May 24, 1935). SPRAY DEVICE. Stanley Majewski, Glendale, Long Island, N. Y. An atomizer is described.

Vast Invasion of United States Predicted

Due to the extremely mild weather which will undoubtedly be followed by an early spring, Dr. A. Edison Badertscher, Chief Entomologist of McCormick & Company, Inc., predicts an unprecedented increase in the number of destructive insects throughout the country this spring. "In some sections," said Dr. Badertscher, "due to the mildness of the weather the insects have not even stopped developing through the winter, and the first warm weather will undoubtedly cause tremendous activity."

Skunks in Pew

Church Services Postponed Until Family Moves Out

Juneau, Wis.—A family of skunks held sole occupancy of St. Matthew's church recently, forcing parishioners to abandon plans for the usual Sunday worship.

William Field, deputy conservation warden, said he expected to have the situation in hand by the following week-end.

"Smoking them out," Field said, "would leave the church smelling almost as bad as with the skunks in it, so we've decided to trap them."

Field said parishioners could trace their trouble to recent warm weather. The 12 skunks, which had been hibernating in the basement, got the idea spring had come and woke up for a romp around the pews.

Members of the congregation expect to club them when they get caught in the traps.

"They're awfully funny animals, though," warned Field. "Sometimes you can walk right up to them and hit them. And, again, sometimes you can't."

"Men, like bullets, go farthest when polished."

Business Opportunities

(Classified)

RATES — For individuals seeking employment, 5c per word, minimum $1.00. All others 10c per word, minimum $2.00. All advertisements must be in the hands of the publishers seven days before publication date and must be accompanied by cash or money order for payment in full. The publishers are not responsible for any false or misleading advertisements.

EXTERMINATORS looking for a business, look this over. Established over ten years in the South. Good reputation and plenty room for business expansion, well known all over the state. Address Box 15—EXTERMINATORS LOG.

THALLIUM SULPHATE

THE
MOST
EFFECTIVE
RODENTICIDE

FOOTE MINERAL COMPANY
1629 Summer Street, Philadelphia

CUTS—It Pays to Illustrate

Write for Prices and Information

THE EXTERMINATORS LOG, Cut Dept.
512 East 14th St. Kansas City, Mo.

Effective Extermination Requires . . .
A Knowledge of Insect Life

An Introduction to Entomology

By JOHN HENRY COMSTOCK
Late Professor of Entomology at Cornell University.

WITH the aid of the 1044 pages of lucid descriptions and 1228 illustrations in this book, all of the important North American insects can be readily identified. The characteristics, habits, and life histories of insects are carefully related in detail. Both common and scientific names are given. The economic importance of each insect is considered and the ravages of the harmful ones are described.

1044 pages, 1228 illustrations, 6″ x 9″
$5.00 Postpaid

Distributed by

THE EXTERMINATORS LOG
512 EAST 14TH ST. KANSAS CITY, MO.

Our Enemy . . . .

The Termite

by Thomas E. Snyder, Senior Entomologist, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

A BOOK FULL OF VALUABLE INFORMATION EVERY MEMBER THAT DEALS WITH TERMITE CONTROL SHOULD HAVE

PRICE $3.00

Distributed by

The Exterminators Log
512 East Fourteenth Street
Kansas City, Missouri

518 Pages—Illustrated with Photographs and Drawings

This is a "must" book for everyone in the exterminating and disinfecting fields. It is a practical book that tells you how and also why. No longer need you be ignorant of the many basic facts with which you come in daily contact.

Sanitary Entomology

EDITED BY WILLIAM DWIGHT PIERCE, PH.D.
Consulting Entomologist
Formerly with U. S. Dept. of Agriculture
Bureau of Entomology
Assisted by Ten Expert Entomologists

A volume of expert, up-to-date information on how insects cause or carry disease; how these insects live; how to prevent disease by controlling insects.

Departing from the usual manner of textbooks, this volume attempts to present the information needed by pathologists in the study of disease transmission; it approaches the control of insects from the standpoint of the sanitarian, the veterinarian, and even of the business man or private householder; it puts the information in the most convenient form for use.

The book also contains information concerning: disinfection of garments; drainage problems; disposal of garbage, excreta, and manure; handling of hog pens, chicken yards and stable yards; packing house problems; and many household problems. This volume is the authoritative statement of ten experts who speak from personal knowledge. It receives the official sanction of the Department of Agriculture, in whose service most of the authors are engaged.

70% Discount on This Book

Publisher's Price $10.00
Our Special Price (including postage)..... 3.15

THE EXTERMINATORS LOG
512 EAST 14TH STREET, KANSAS CITY, MISSOURI

Now

SUR RID

Bedbug Concentrate

The Latest Scientific Development in Bedbug Insecticides

IMPORTANT

Insecticide made with our SUR RID Bedbug Concentrate has an invisible residue, which is effective on bedbugs as long as seven days after surface has been thoroughly sprayed.

It will not stain and is non-poisonous, when used as directed.

It is a four-to-one concentrate and the price in five gallon lots, which is a sufficient amount to give this product a fair trial, is $2.00 per gallon, F. O. B. St. Louis, Mo. Write for prices in larger quantities. Freight prepaid on 15 gallons or over.

Stop passing up Bedbug work. Give Sur Rid Bedbug Concentrate a trial and be convinced that it is a real boon to Exterminators.

Sold to Exterminators only.

15c PER POUND
IN ONE-POUND TIN CANS

A Non-Poisonous Rat Killer

For Safety, Effectiveness and Economy

USE SUR RID RAT KILL

Try It—It Saves Time and Money

SUR RID RAT KILLER

is tested in our own laboratory on both wild and tame rats and we GUARANTEE the Killing Power.

You can now buy SUR RID Rat Killer, packed in one pound cans, mixed, ready to use with Red Squill or Arsenic as the toxic principle, packed in Meat, Fish, Cereal and in addition a new lure, Canteloupe, at 15c per pound in one gross lots F. O. B. St. Louis.

Can you afford to mix your own Rat Bait at this low price?

	Per Dozen
Three Dozen Lots, labeled	$2.00
Gross Lots, labeled	1.90
Gross Lots, no label	1.80
The half-pound size, packed four dozen to a case	1.25

All Prices F. O. B. St. Louis

Also Packed Under Private Label

★

Real Exterminating Products Co.

1900-04 NORTH NINTH STREET
ST. LOUIS, MISSOURI